

57



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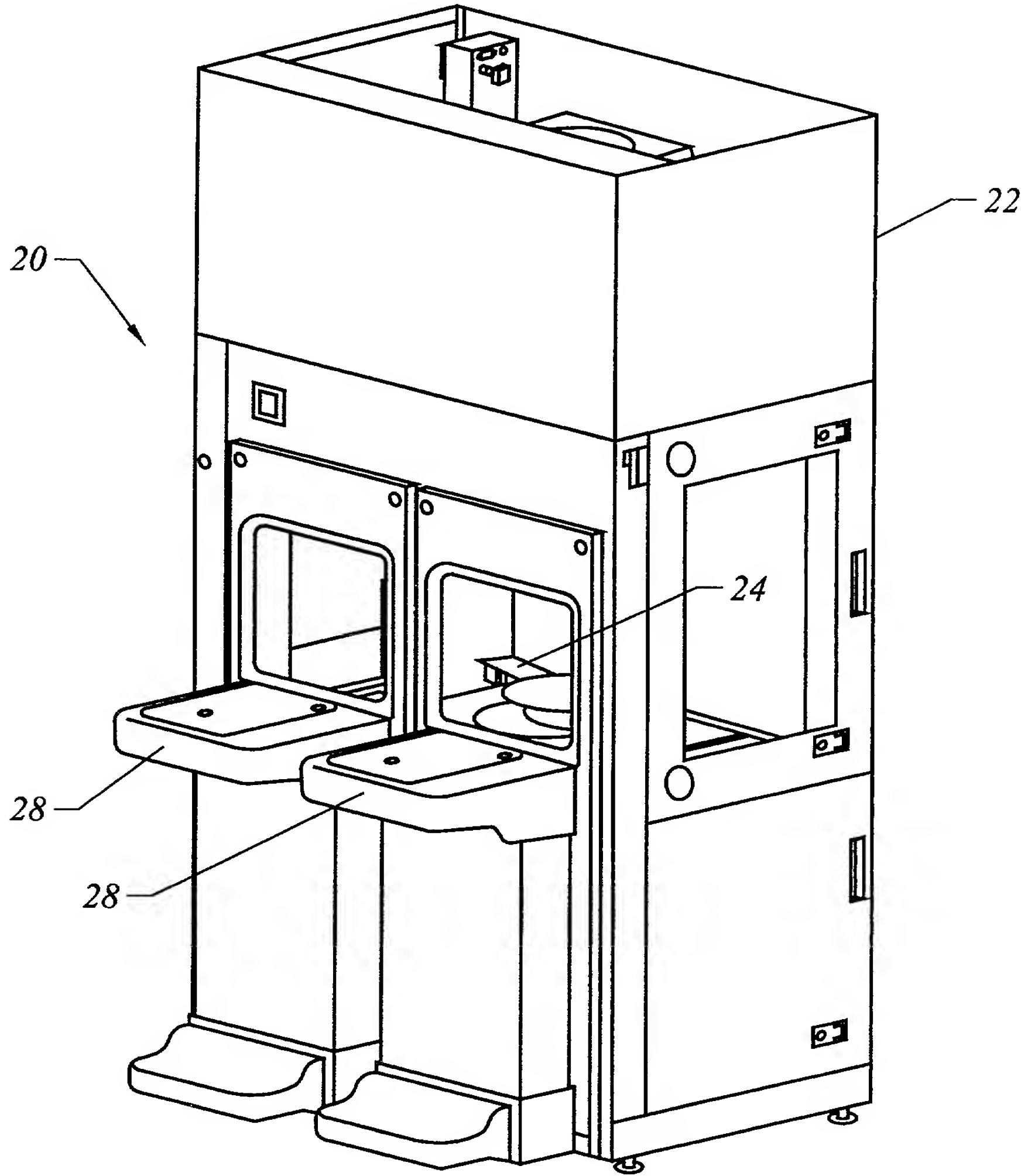
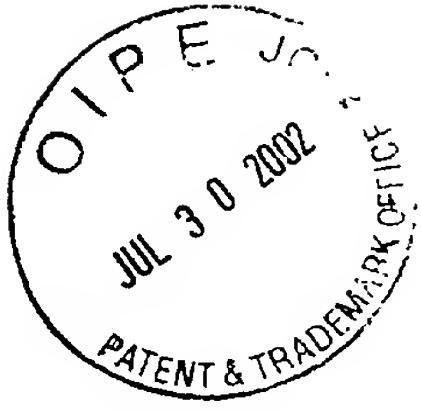


FIG. 1

10037092-0001



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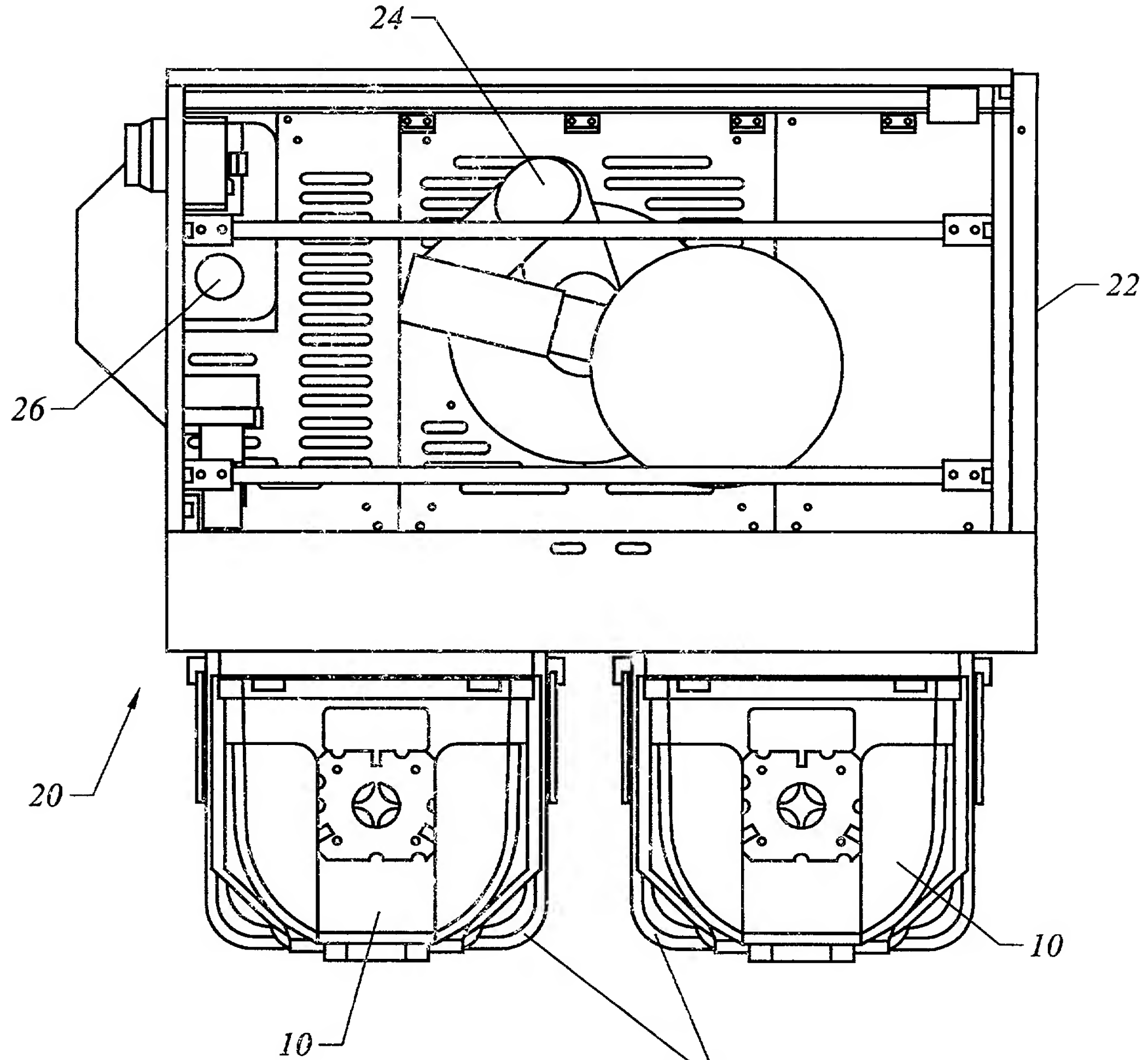


FIG. 2



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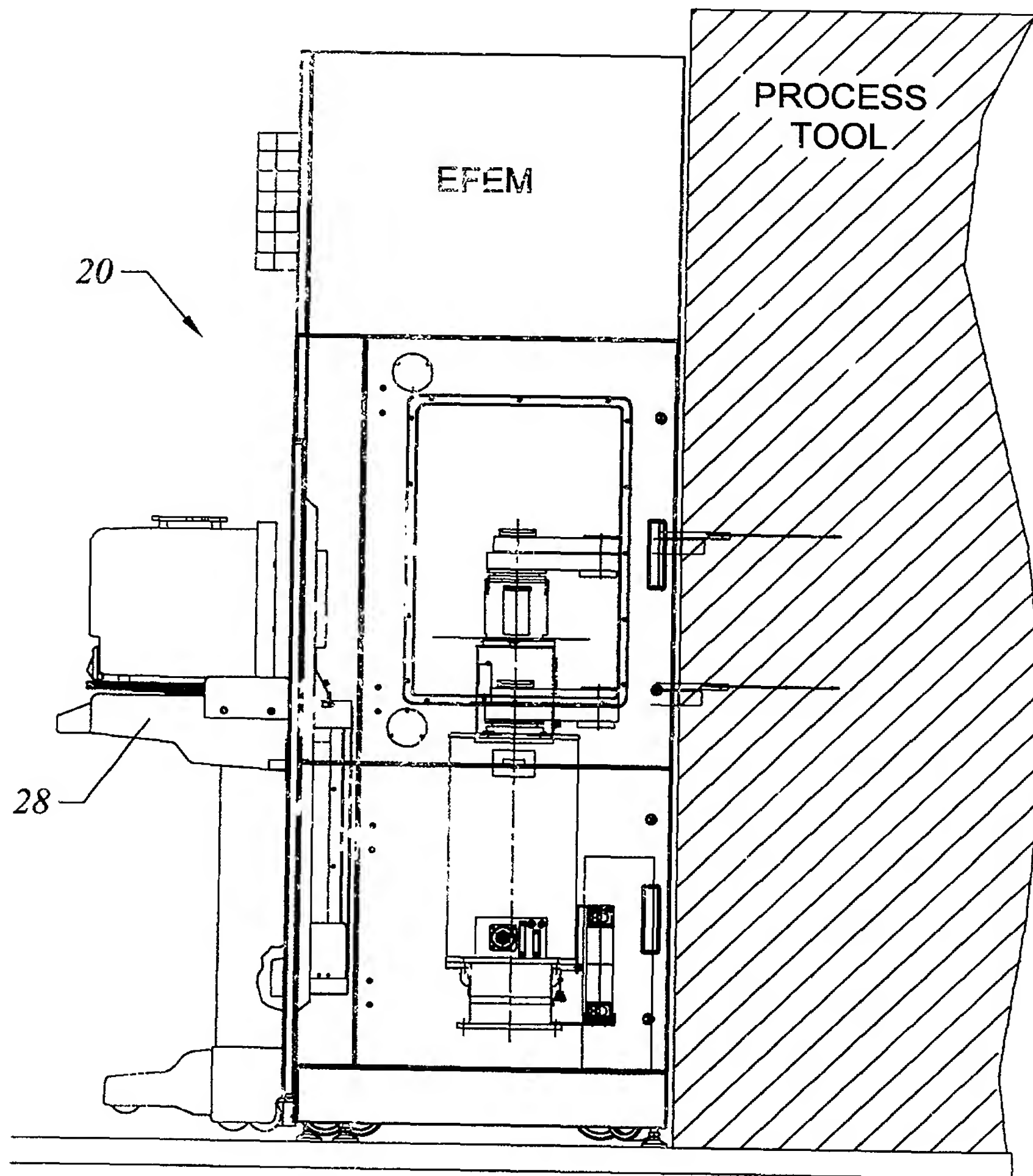


FIG. 3

20020220



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Title: SEMICONDUCTOR MATERIAL HANDLING SYSTEM
Inventor: Anthony C. Bonora Docket No.: 34741-774
Serial No.: 10/087,092 Attorney: Scott D. Sanford
Filed: March 1, 2002 Telephone: 415-984-8700
Sheet 4 of 34

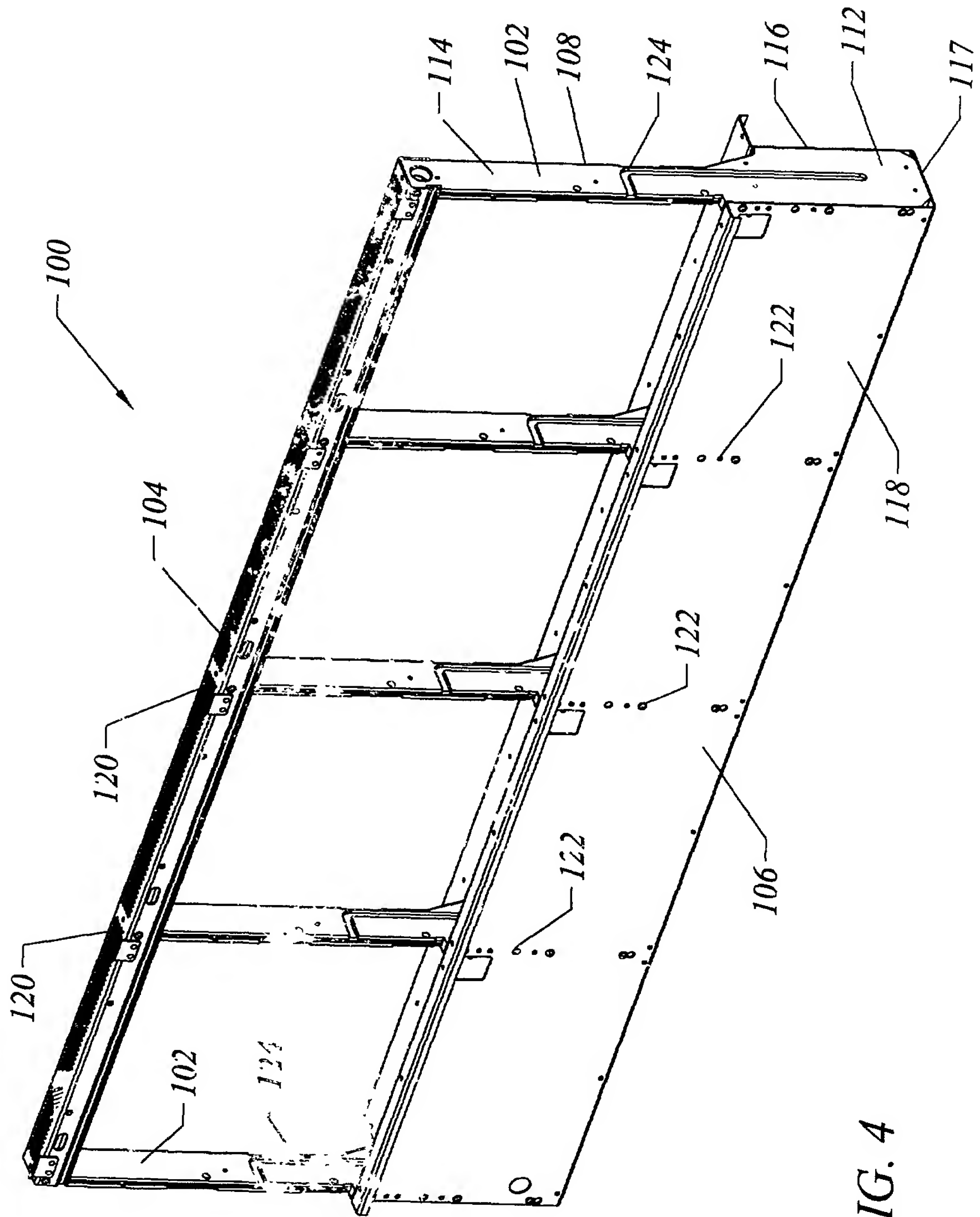


FIG. 4



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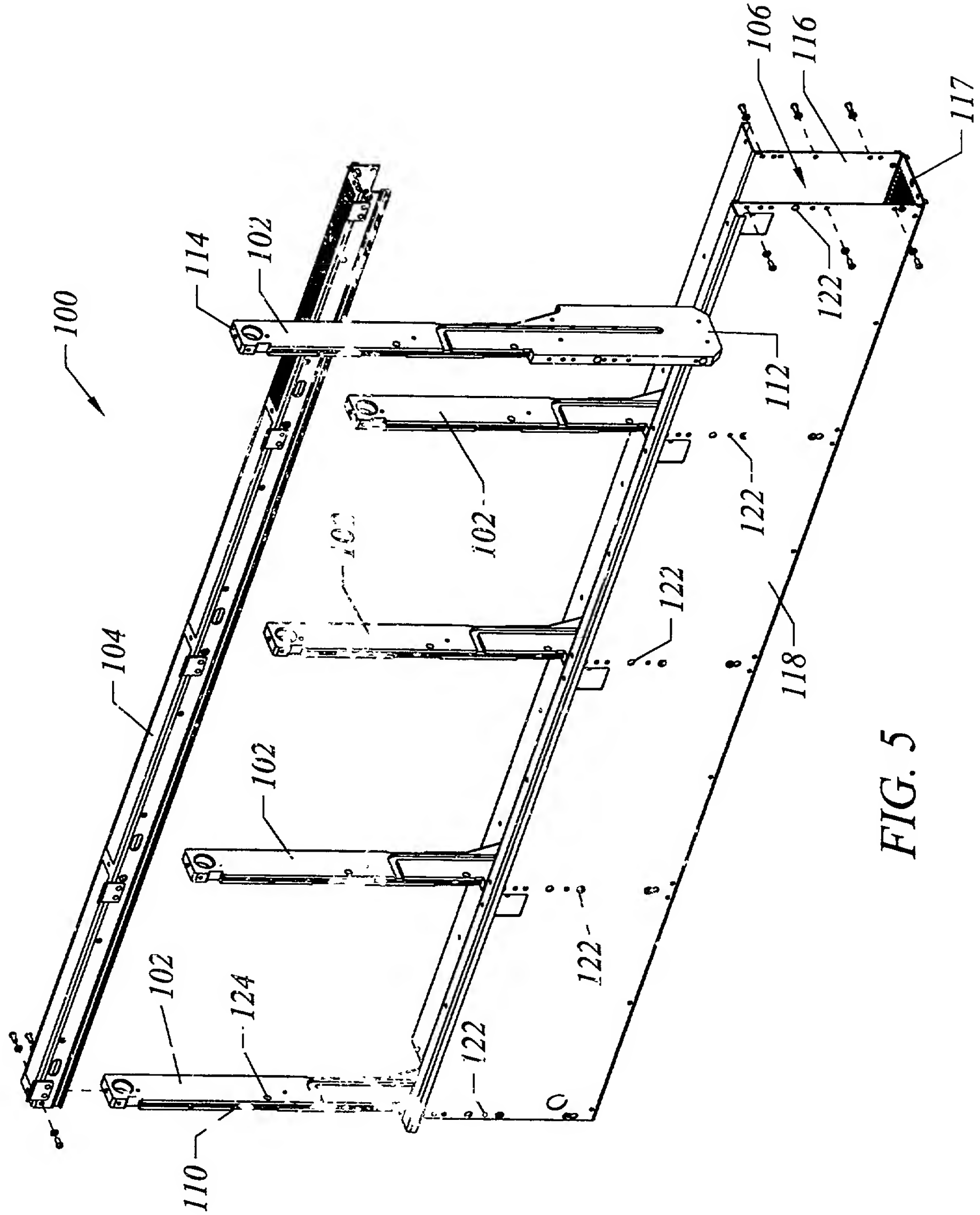


FIG. 5



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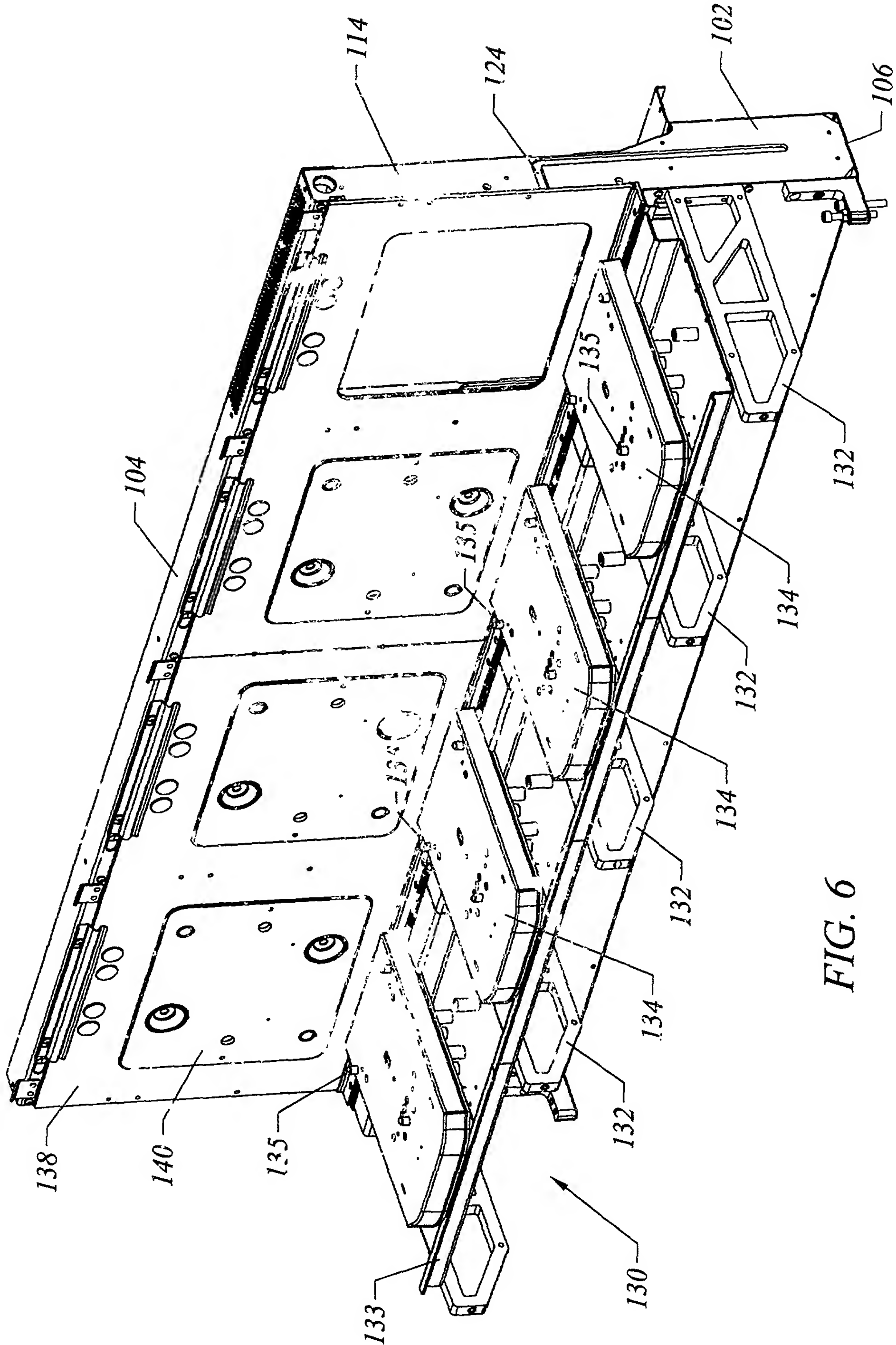


FIG. 6

2006/02/26 2007



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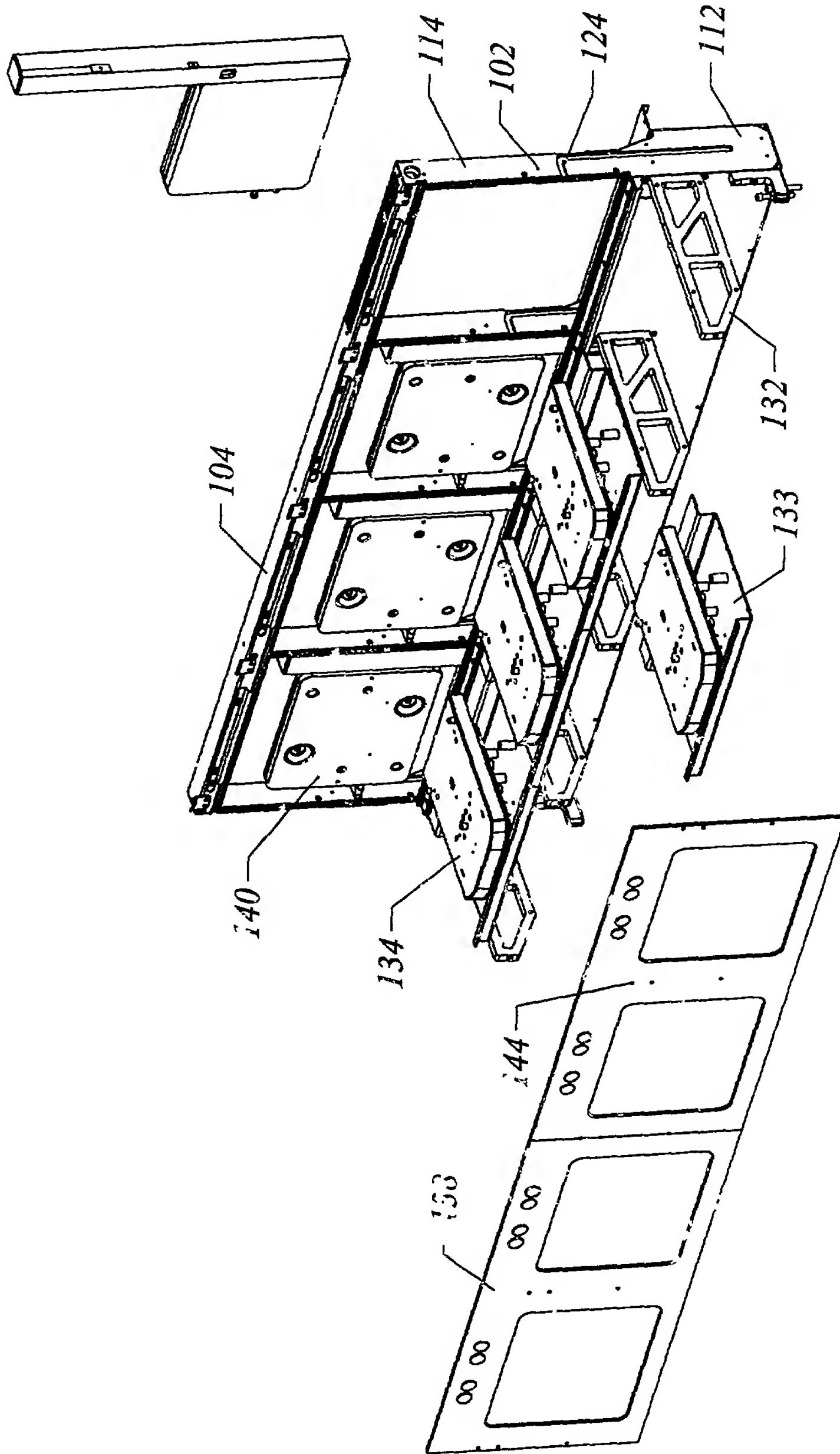


FIG. 7



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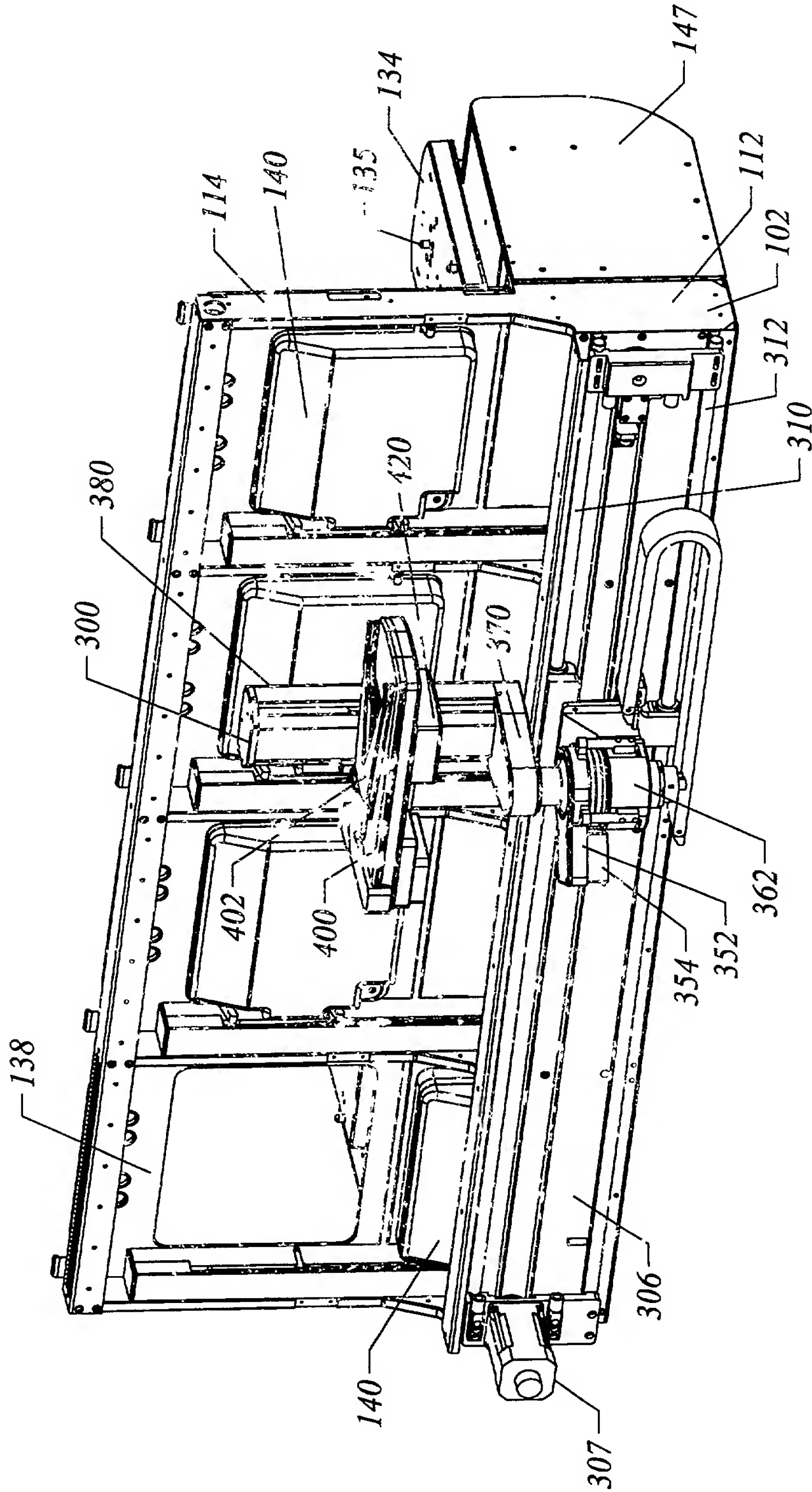


FIG. 8

20020326023001



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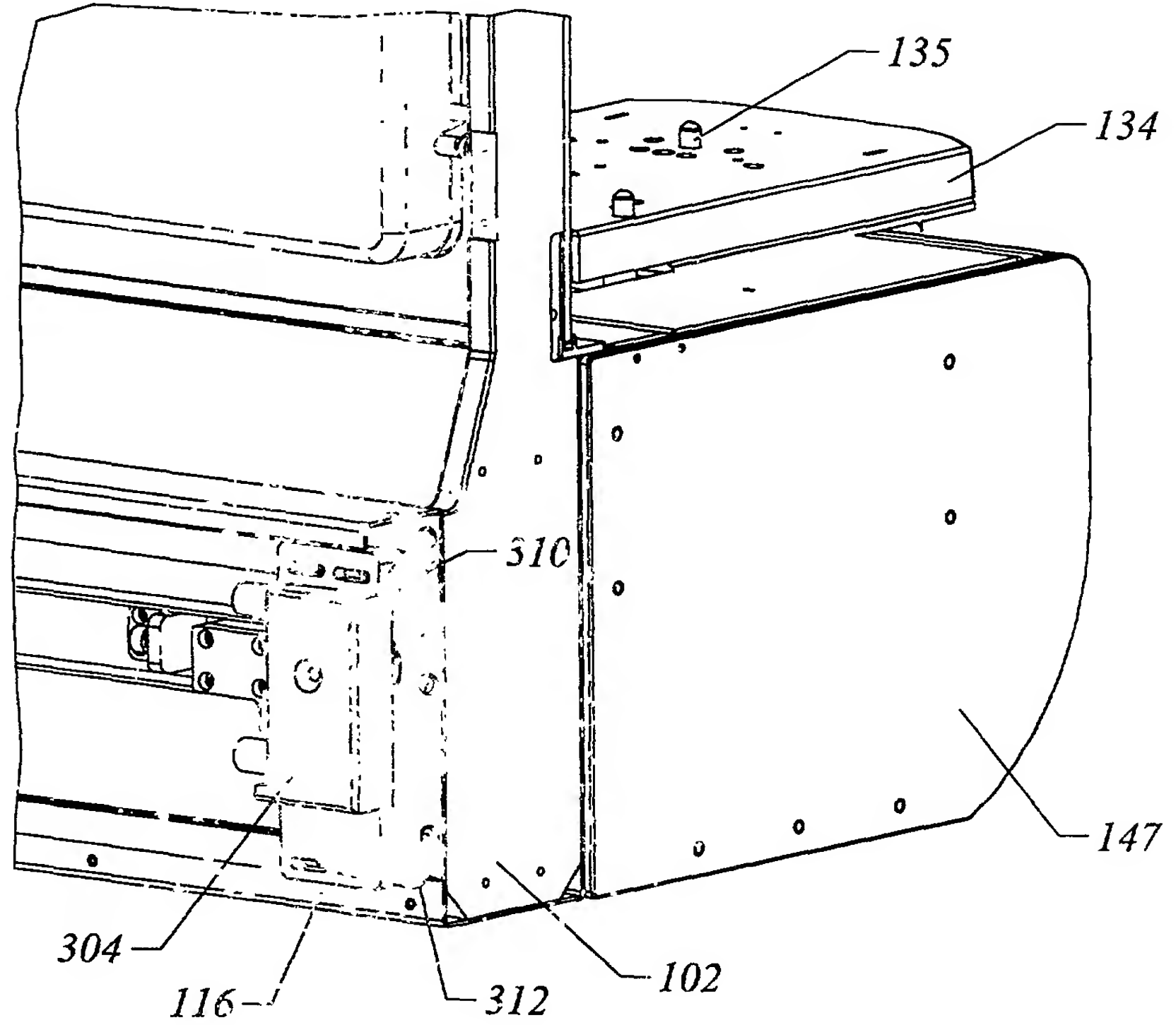


FIG. 9

10087092-2002



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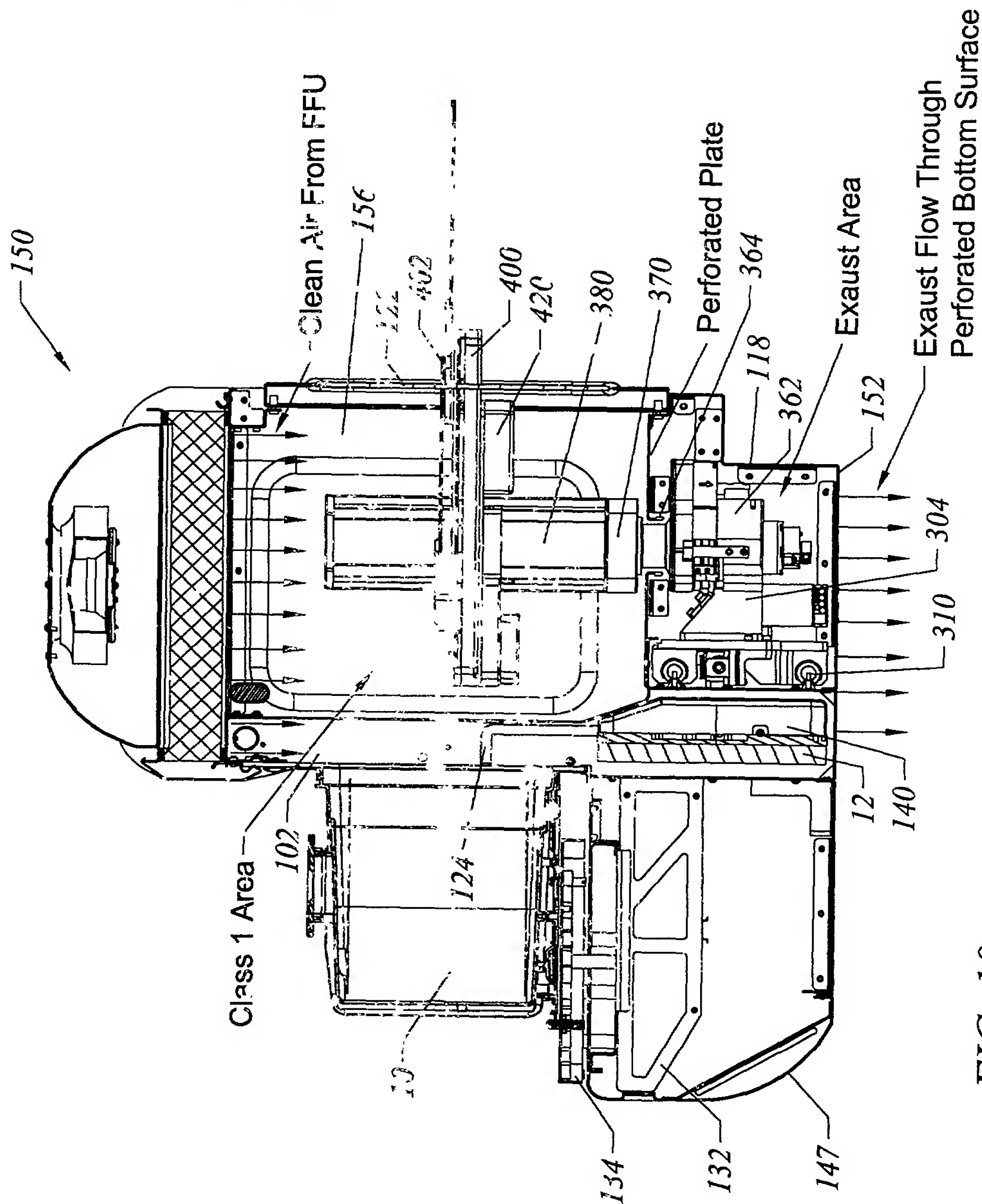


FIG. 10



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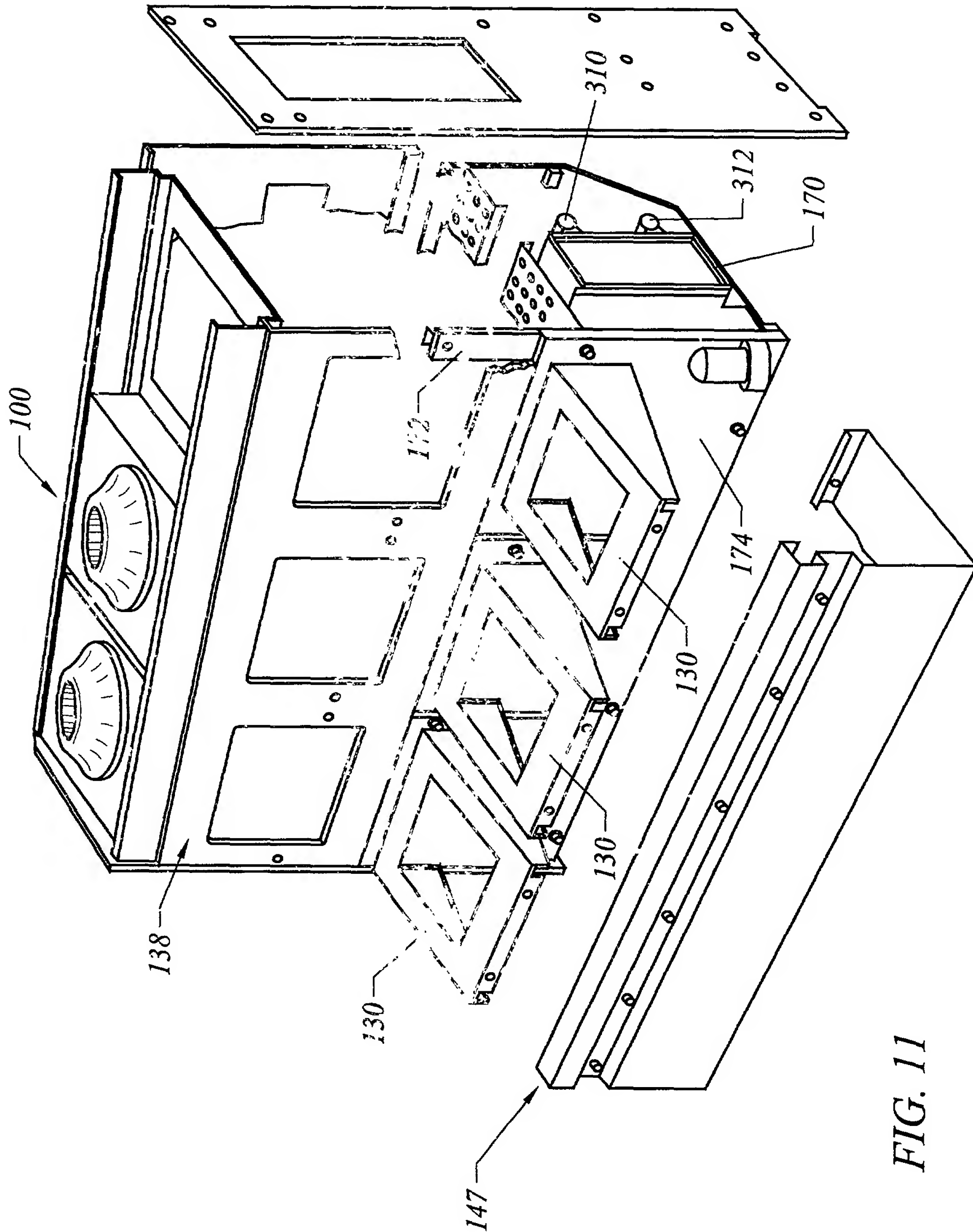


FIG. 11

300x0" 260x200"



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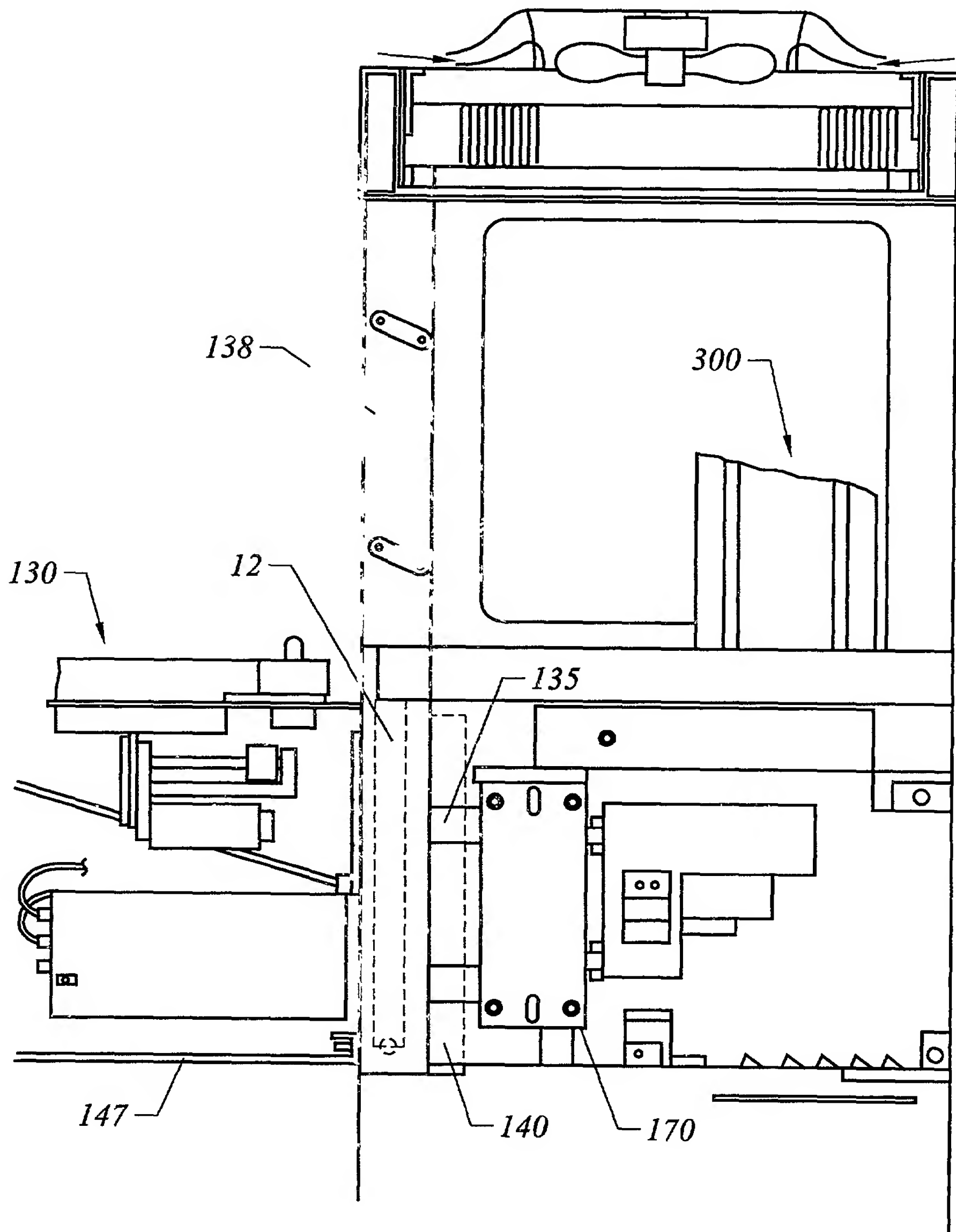


FIG. 12



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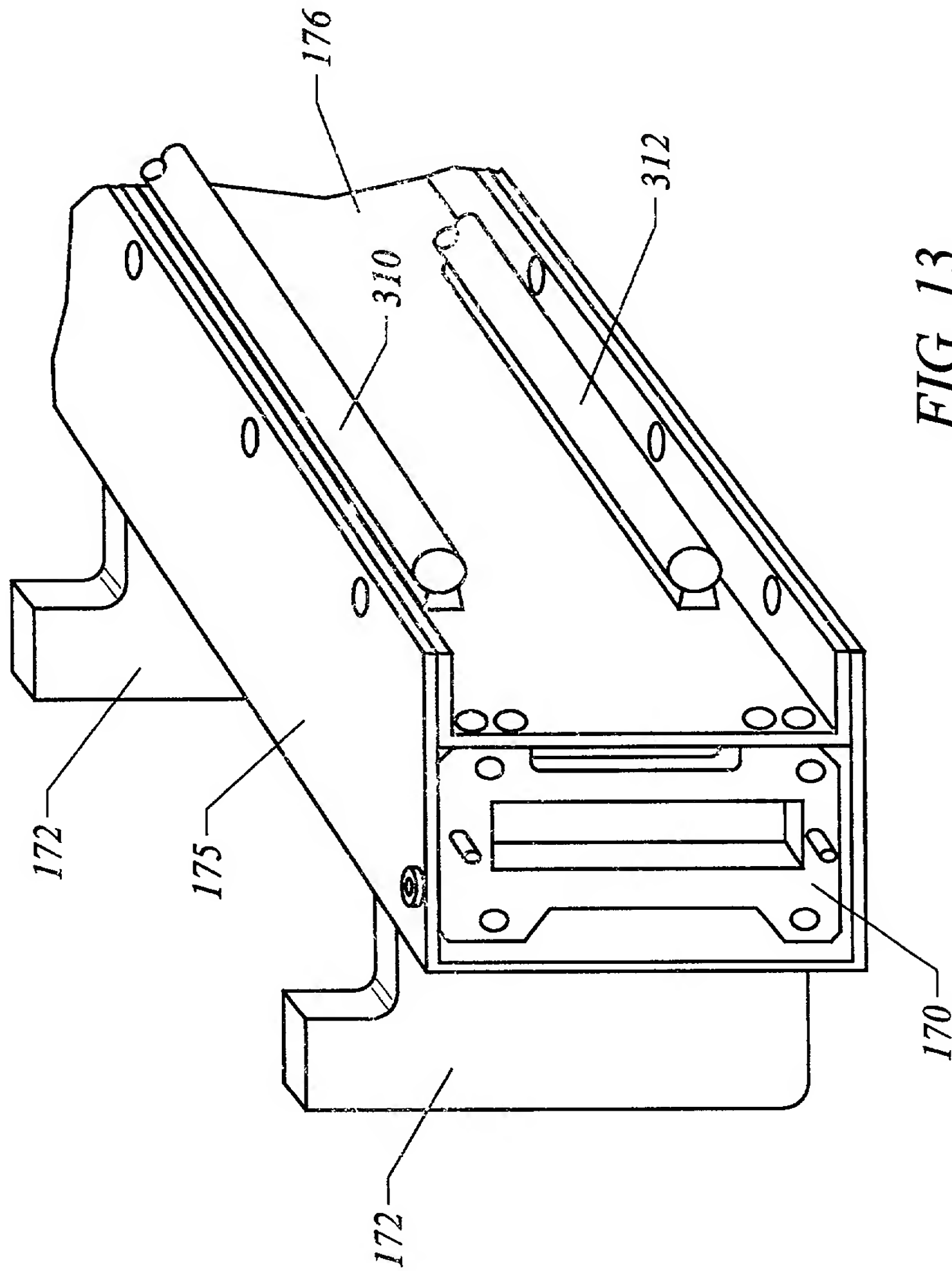


FIG. 13

2002/03/26 09:00



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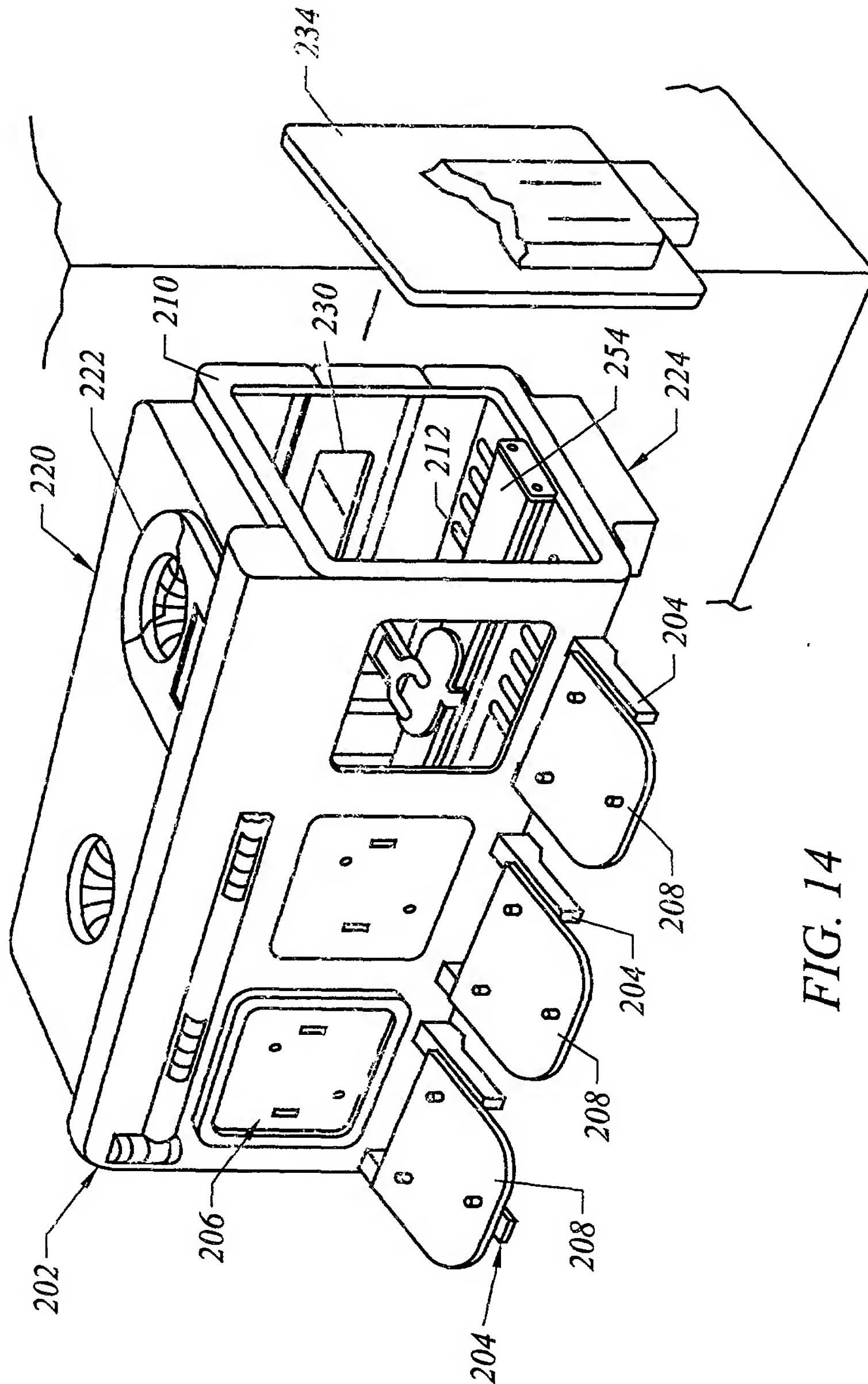


FIG. 14

THE UNIVERSITY OF CHICAGO





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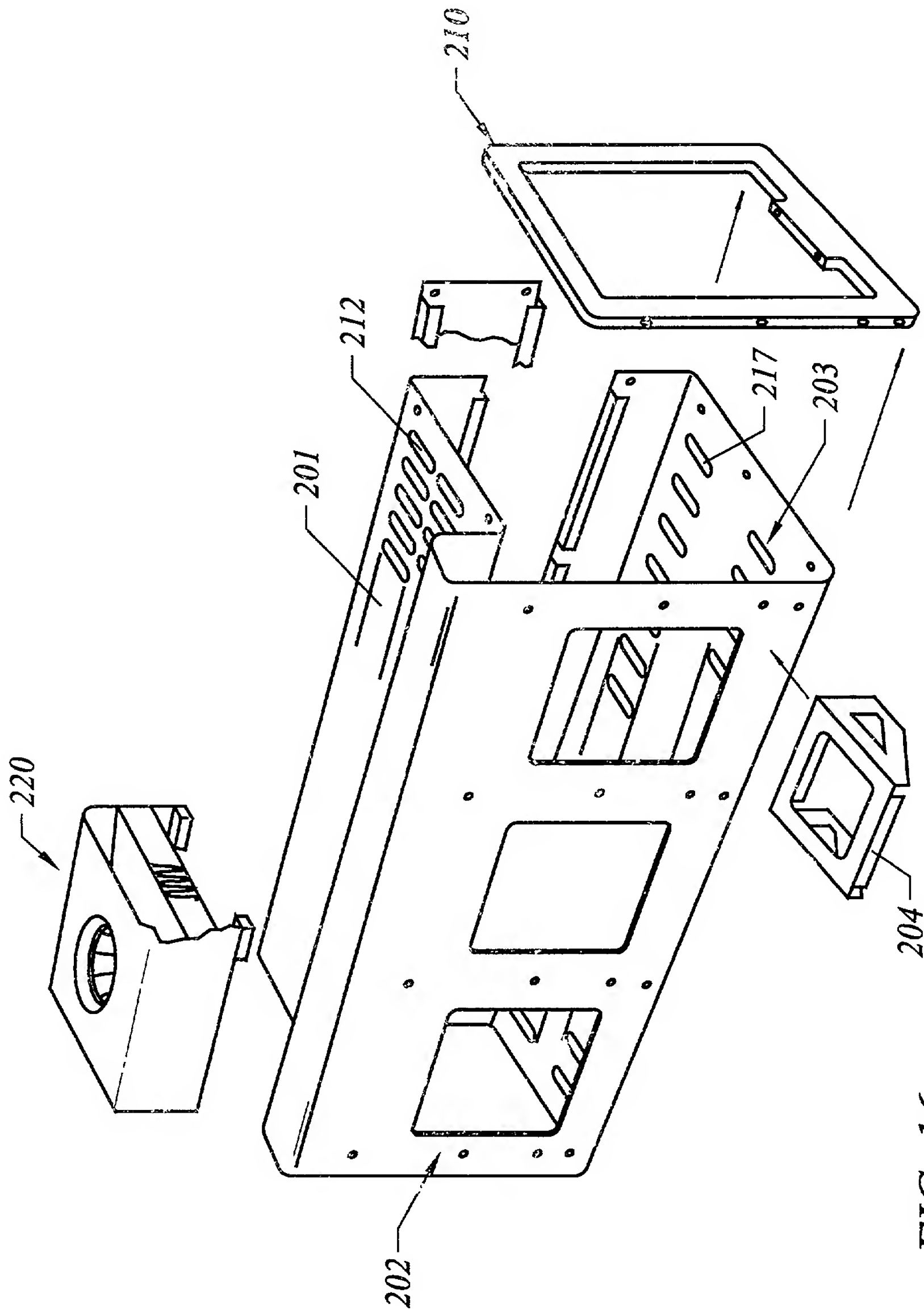


FIG. 16

2006/07/20 250/800T



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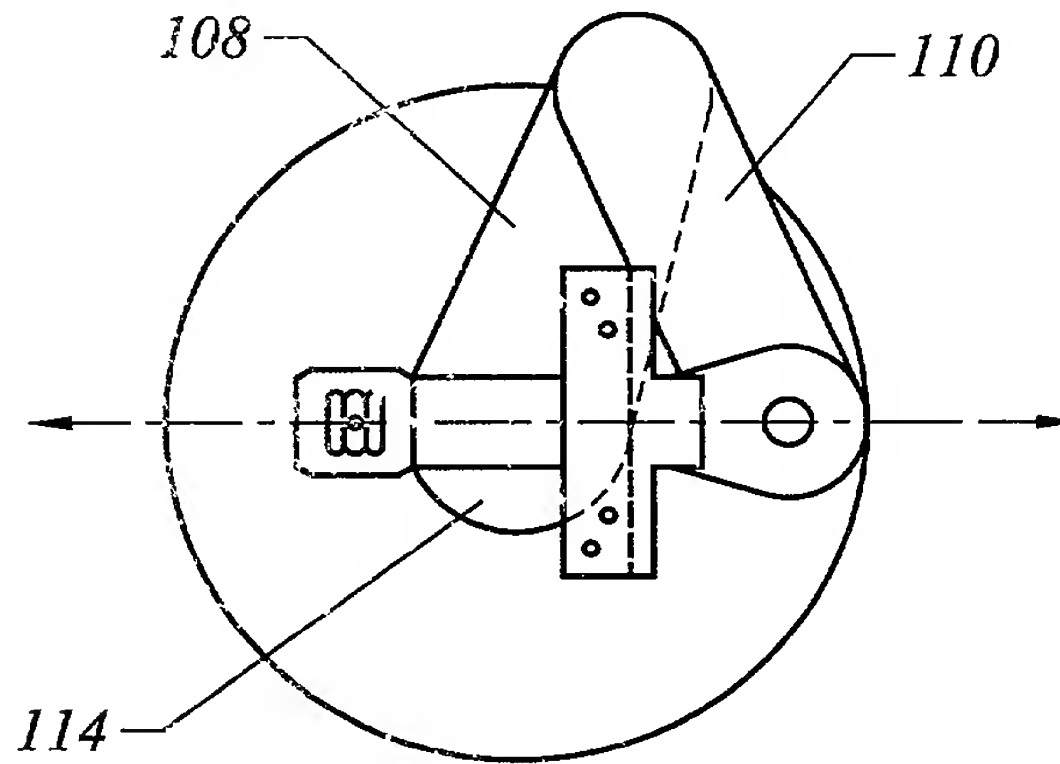


FIG. 17A
(Prior Art)

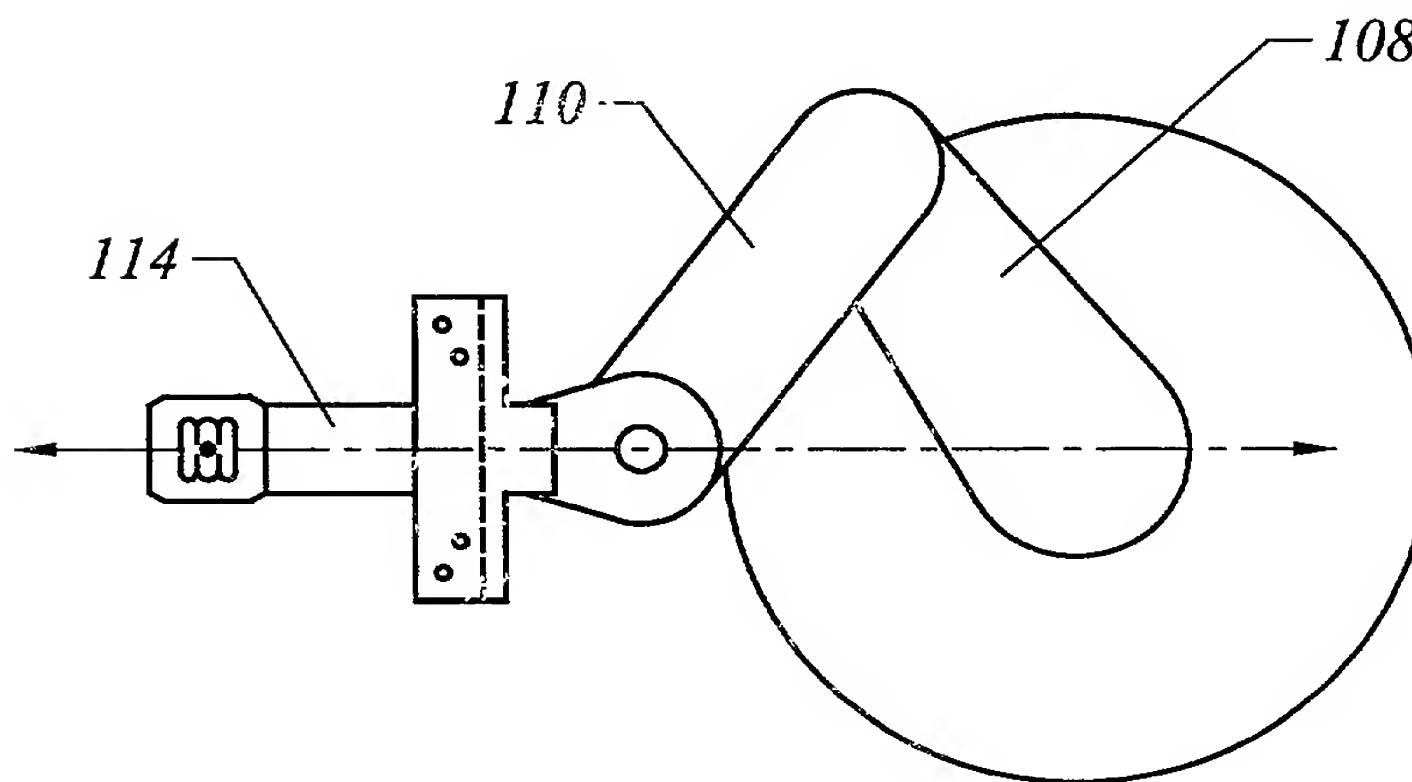


FIG. 17B
(Prior Art)

2002-03-01



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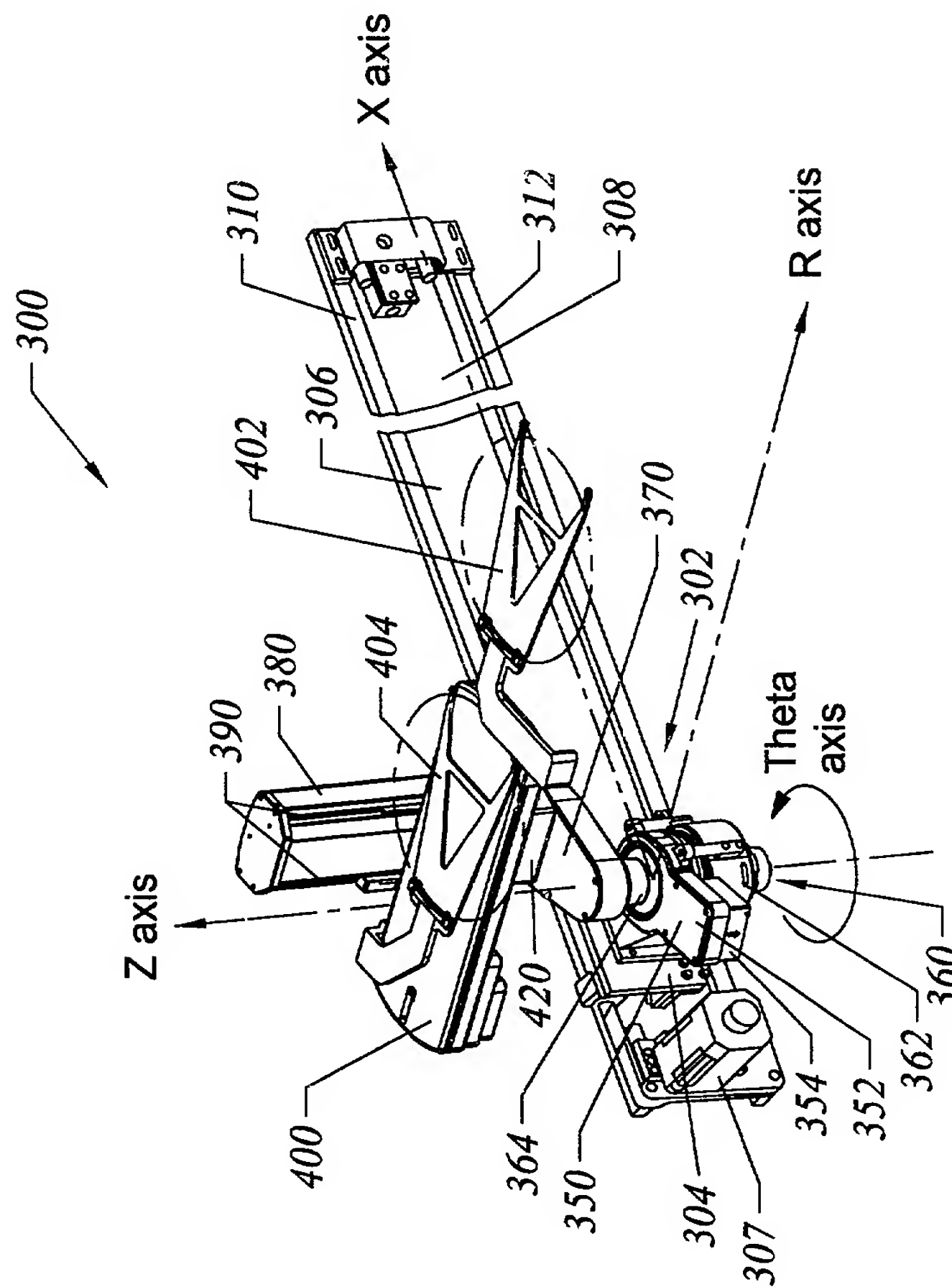


FIG. 18



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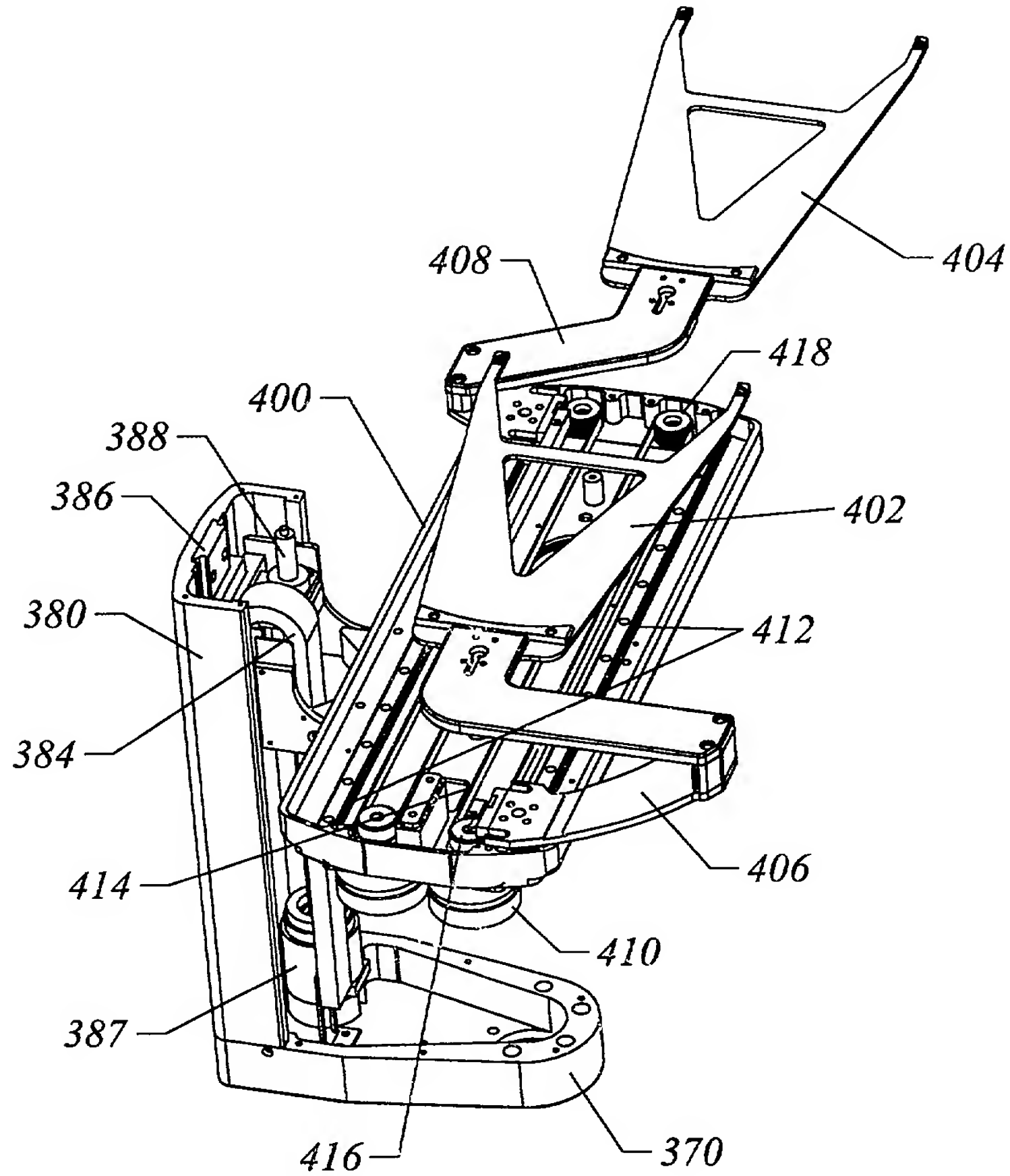


FIG. 19



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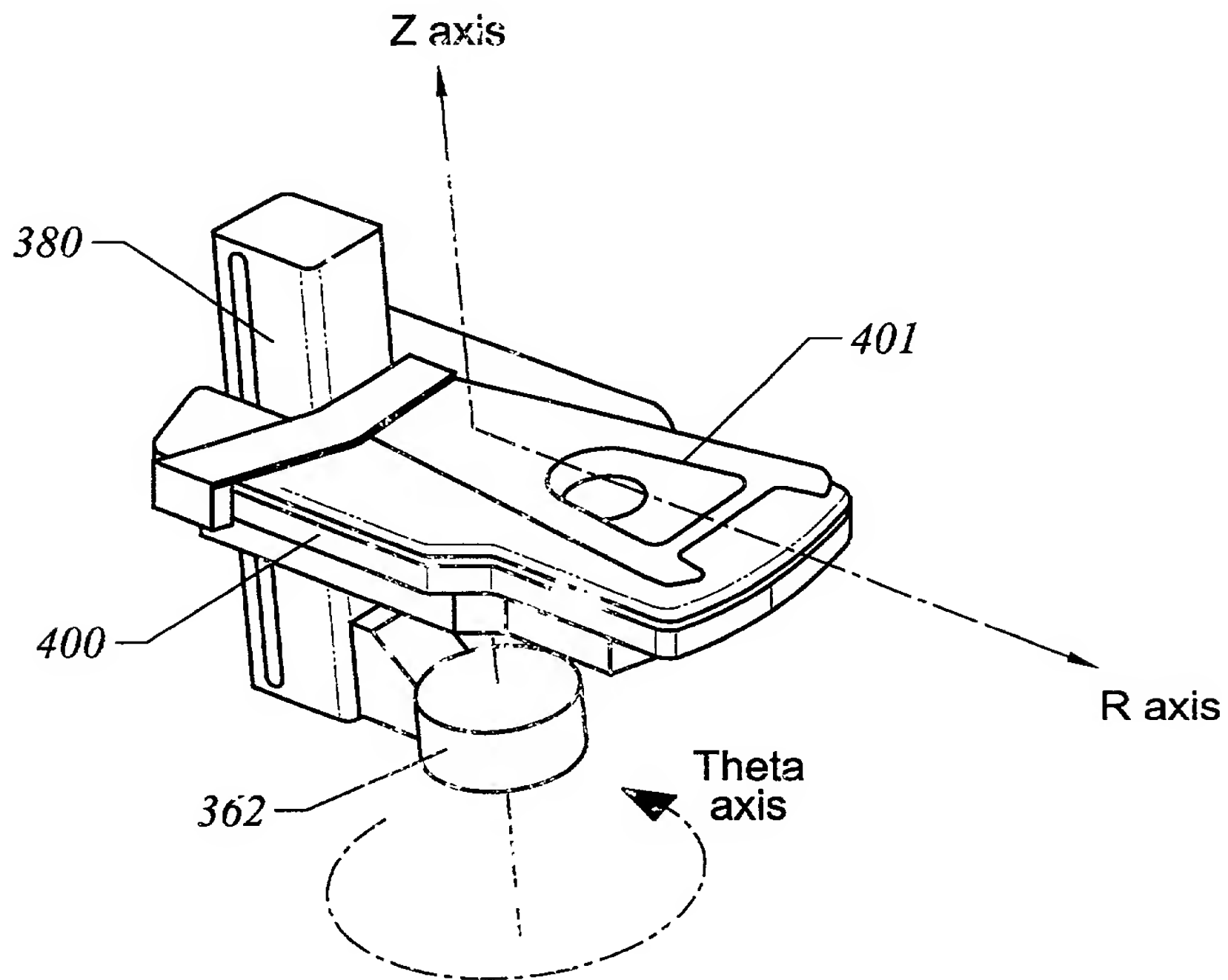


FIG. 20



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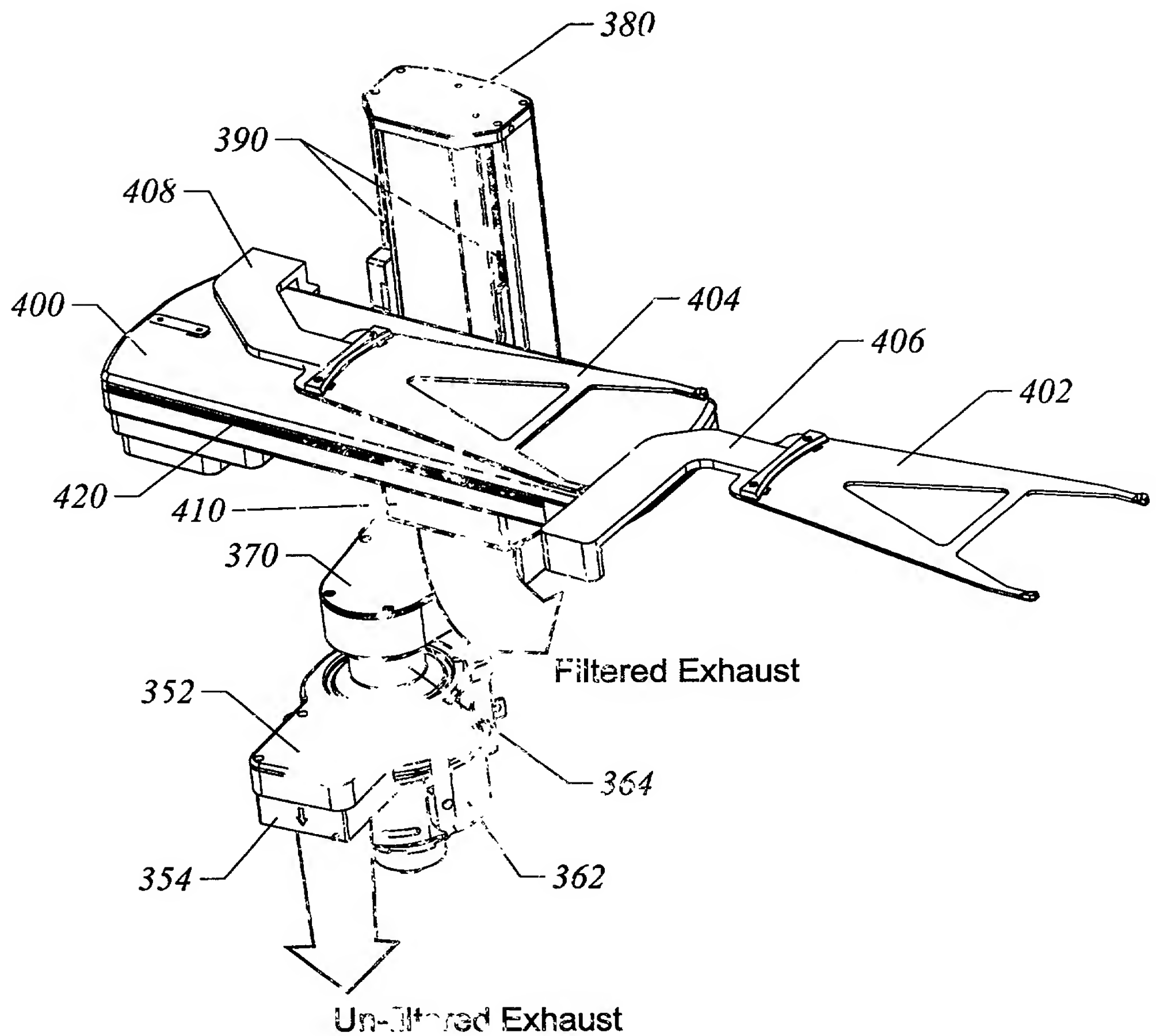


FIG. 21



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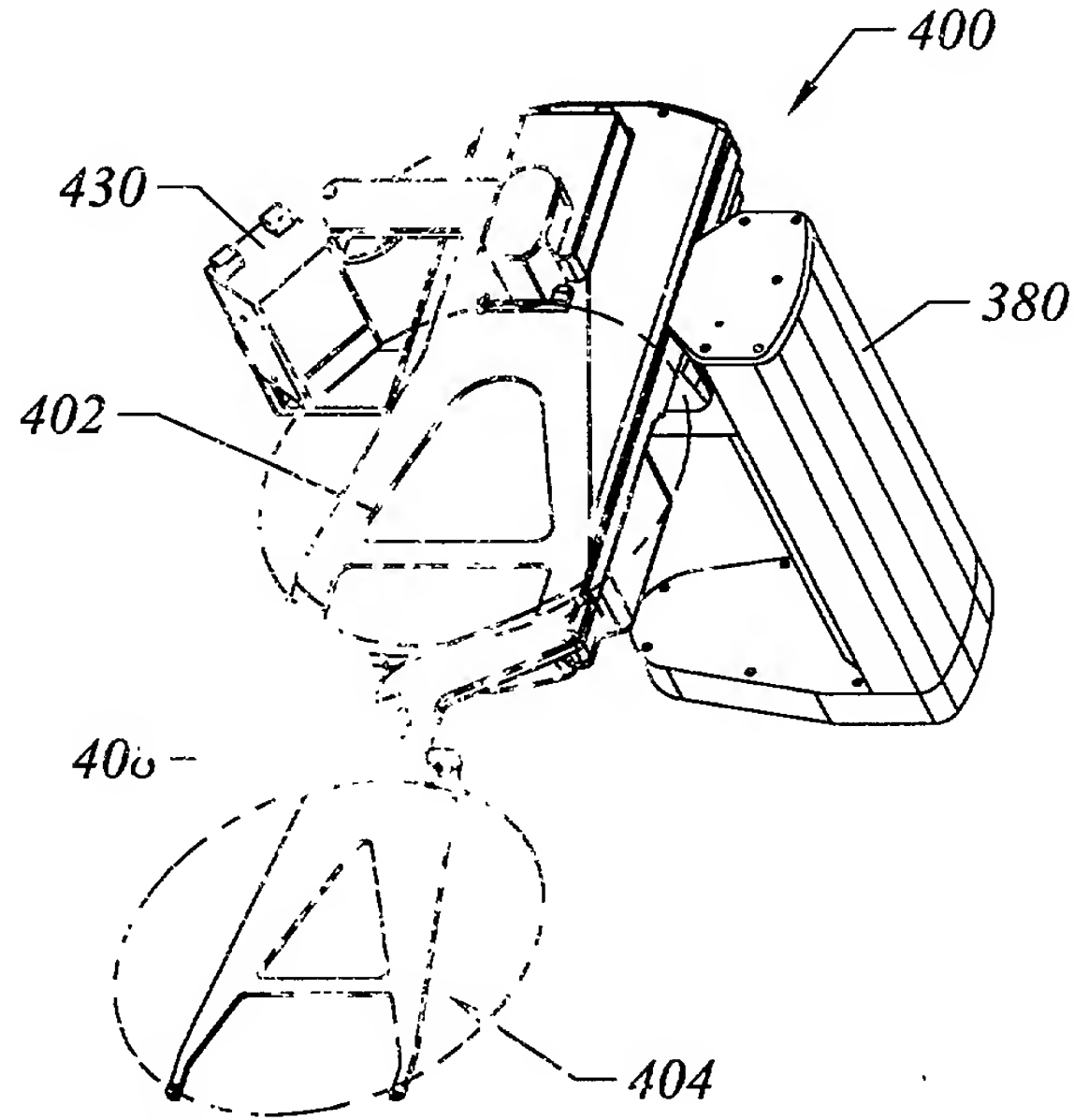


FIG. 22A

2002/03/01 22:00:00



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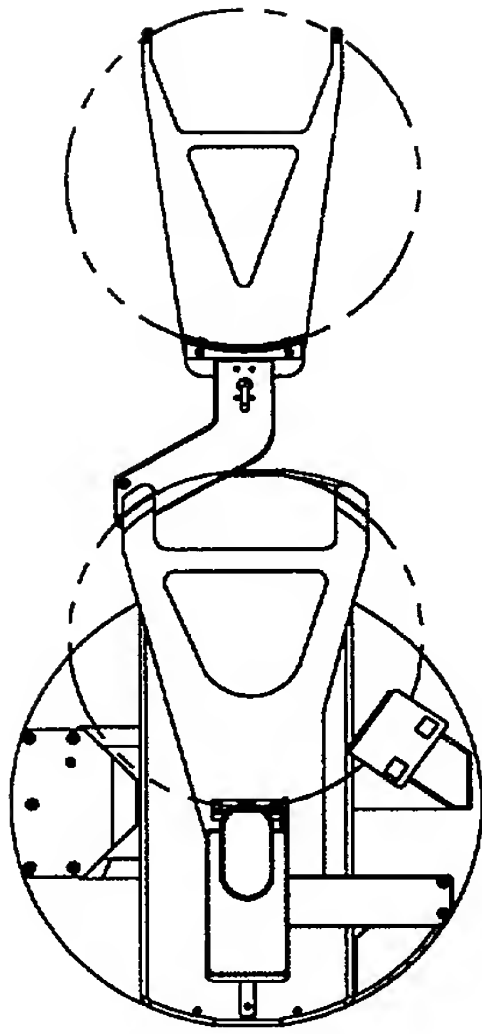


FIG. 22B

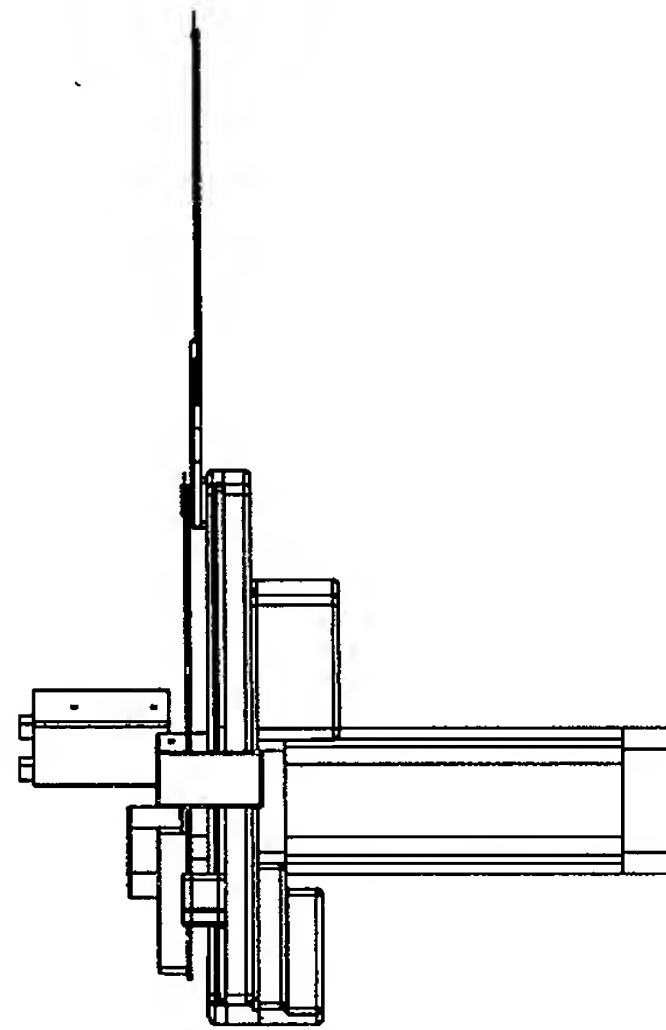


FIG. 22C

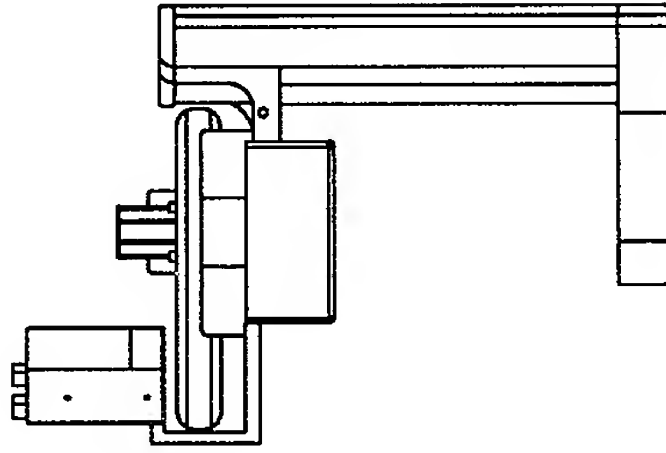


FIG. 22D

20020301 250/8001



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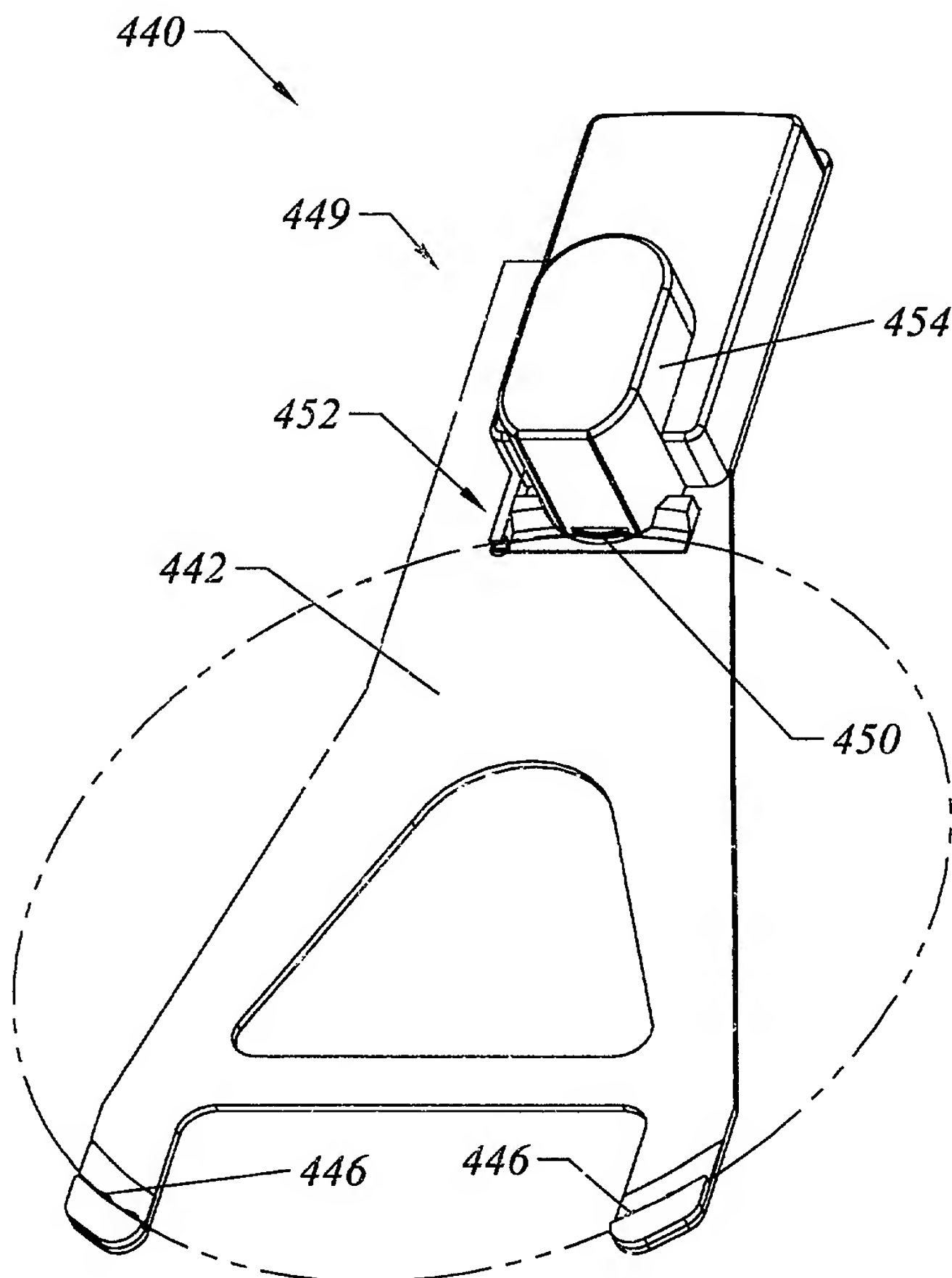


FIG. 23

2002/03/20 22:02:00



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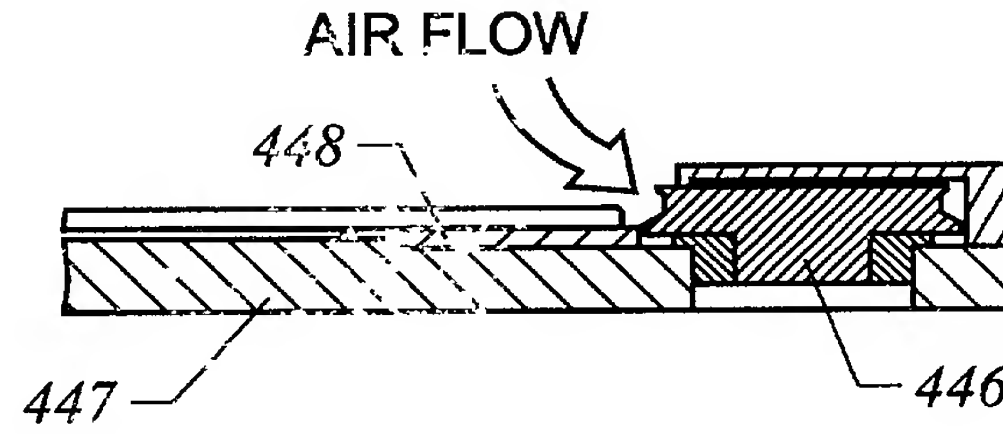


FIG. 24A

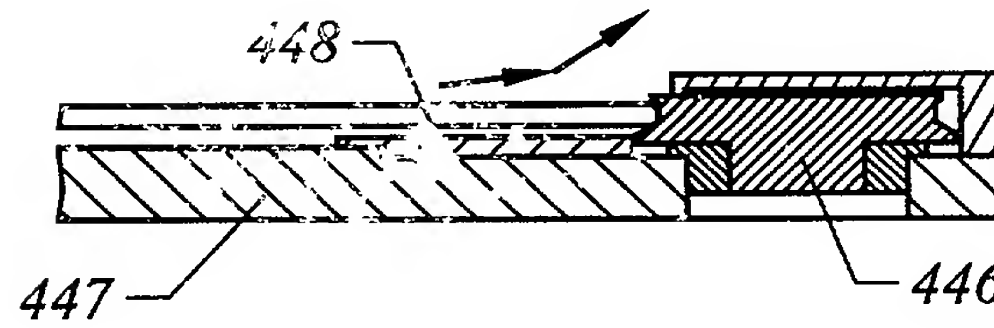


FIG. 24B

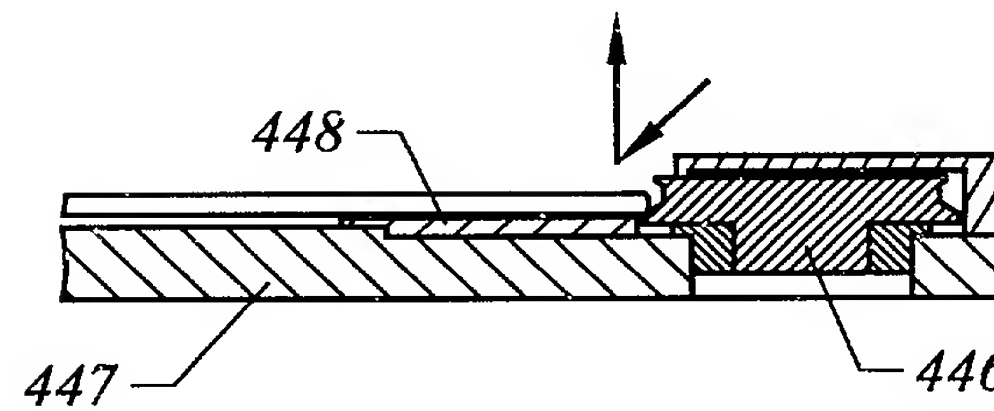


FIG. 24C

2002/03/01 10:30:00



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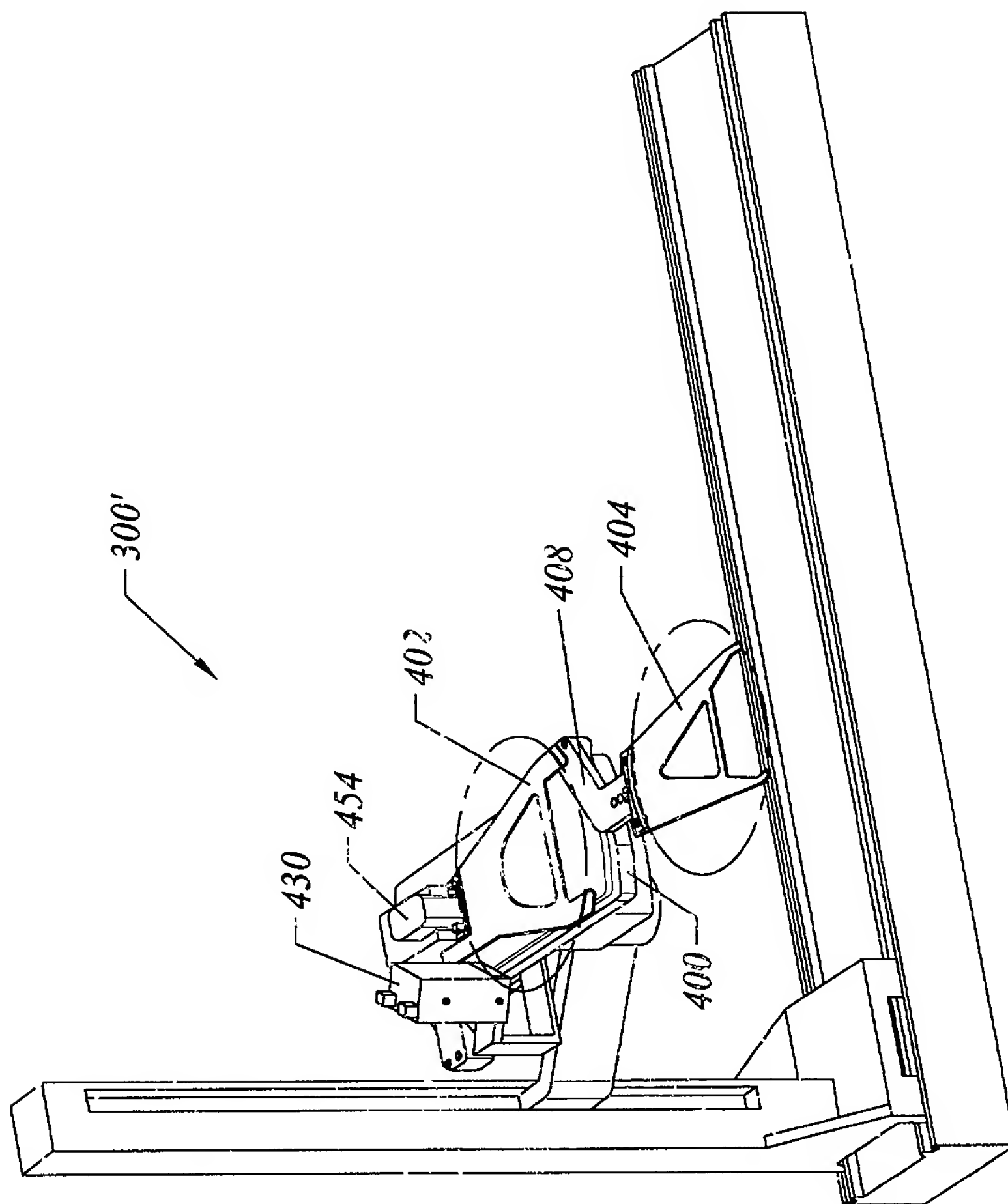


FIG. 25



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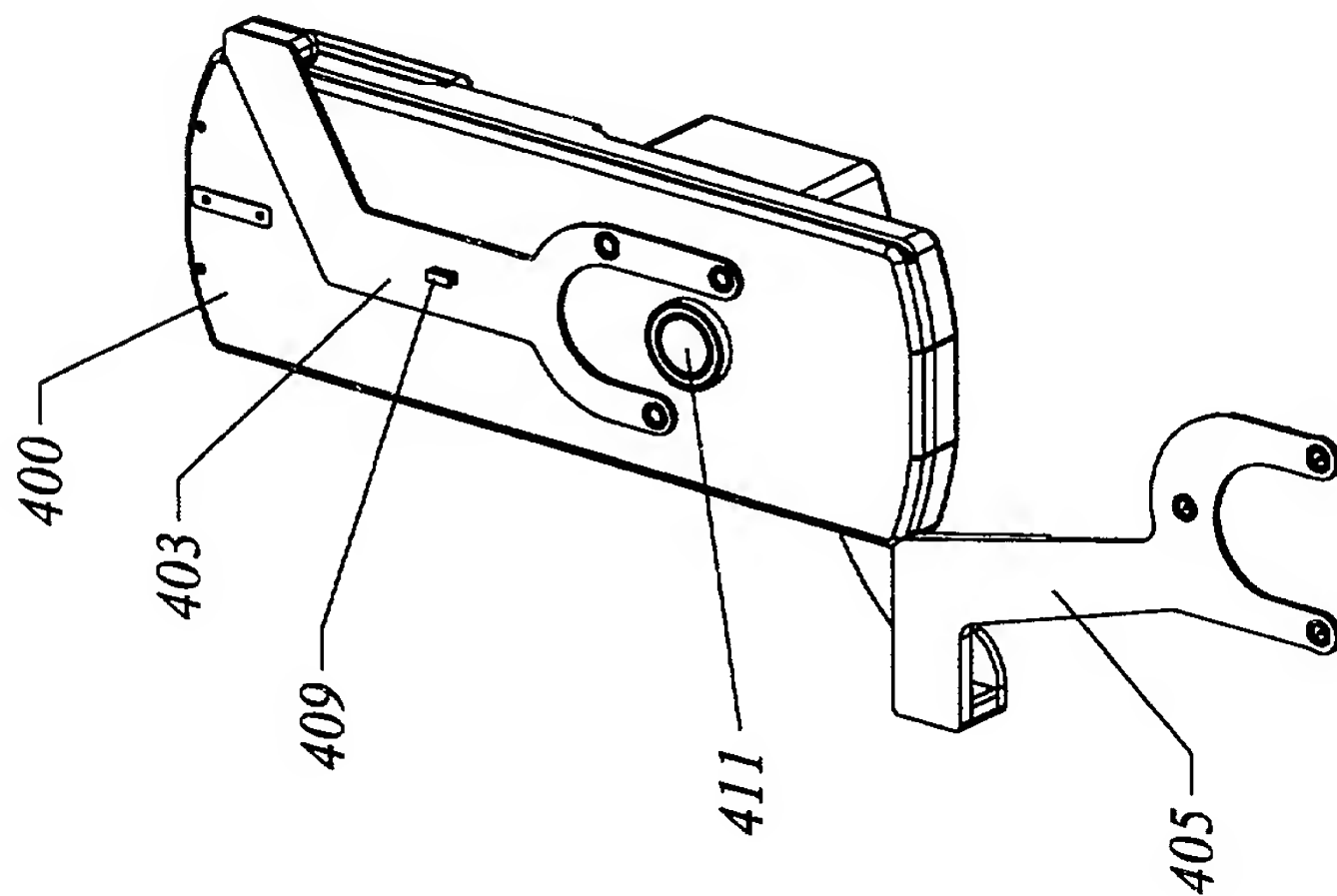


FIG. 26B

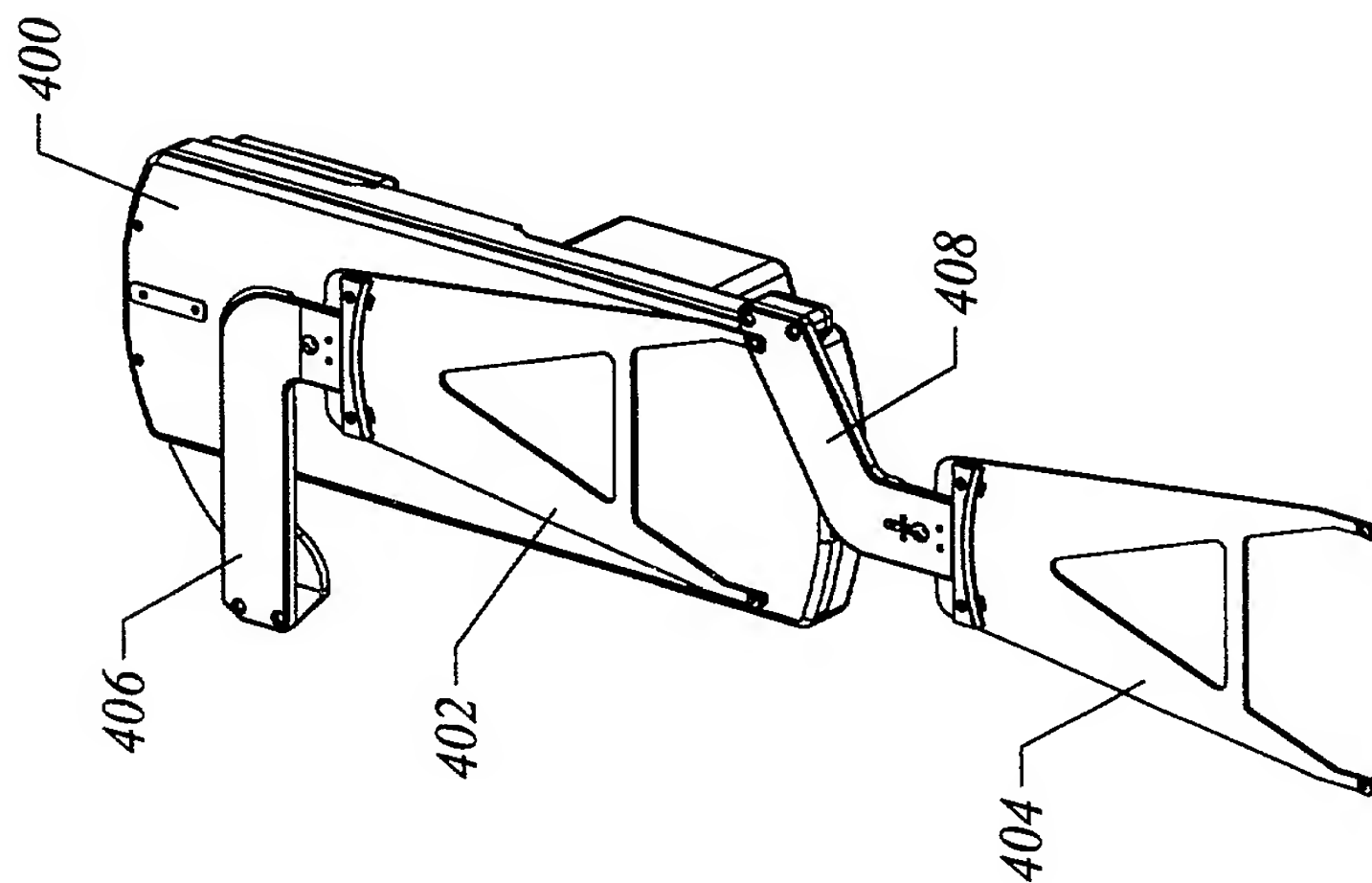


FIG. 26A

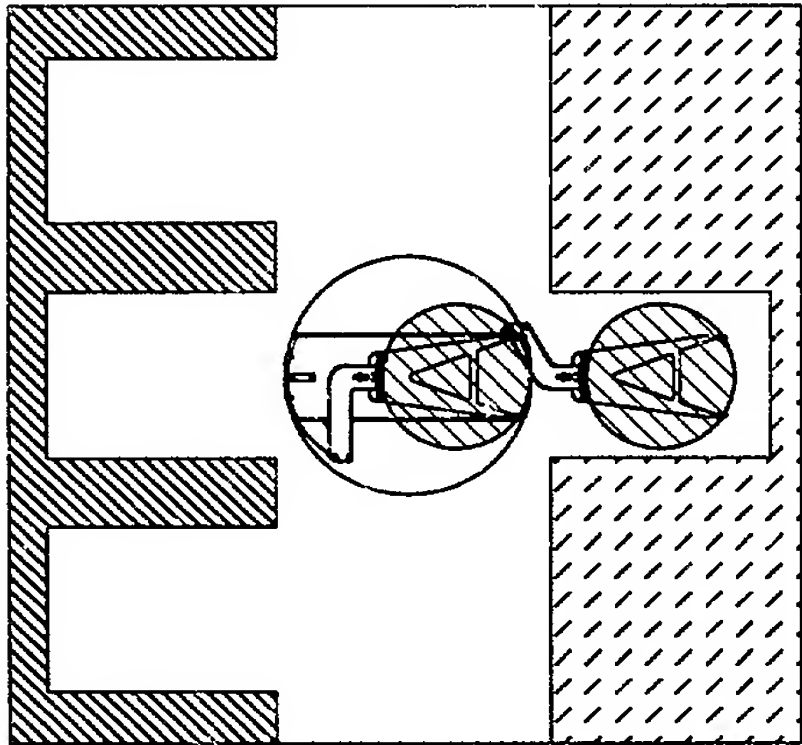
2002/03/30 2002/03/30

300E/0" 250/300T

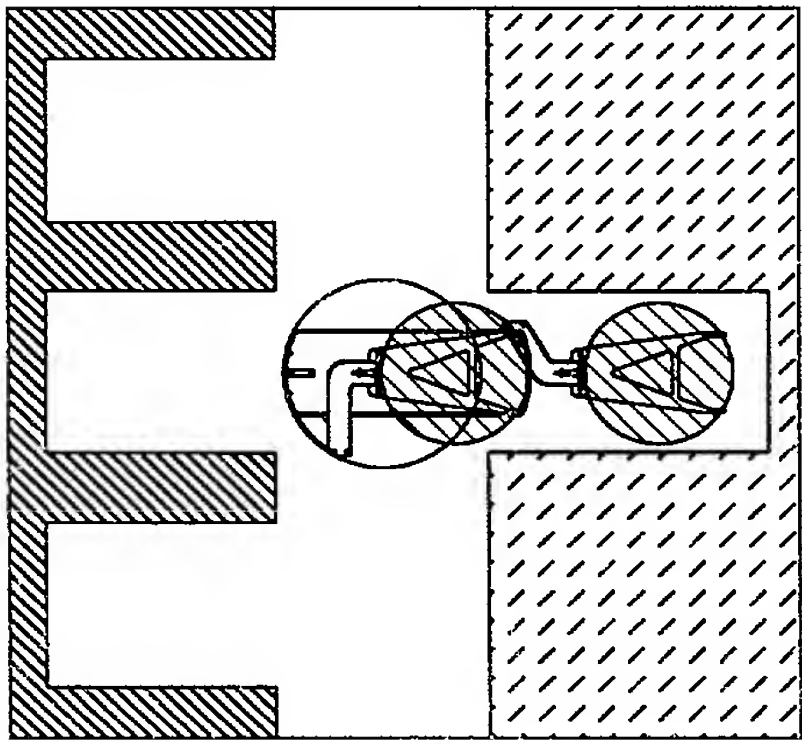


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Conventional Linear Slide Robot



Off-Center Side-Body (50mm offset)



EFEM Process Tool

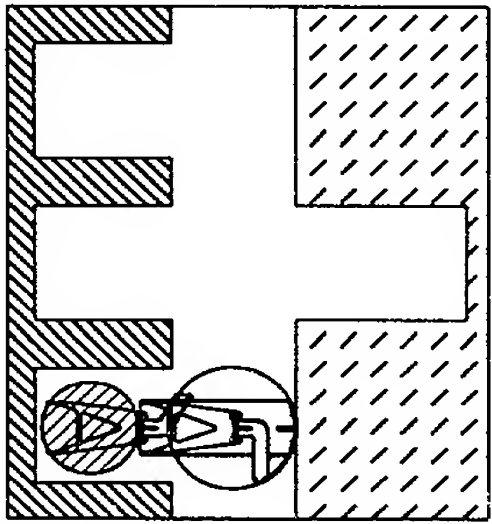
FIG. 27A

FIG. 27B



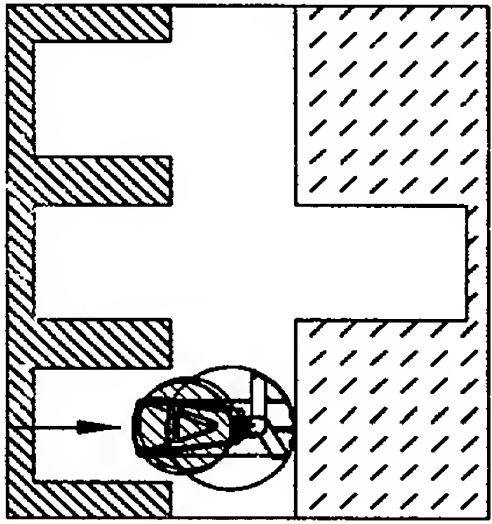
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Example motion sequence for rapid swap slide-body with off center rotation axis.



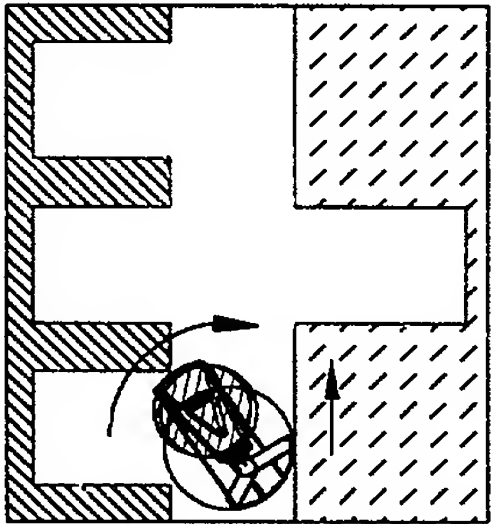
lift wafer at
load port 1

FIG. 28-1



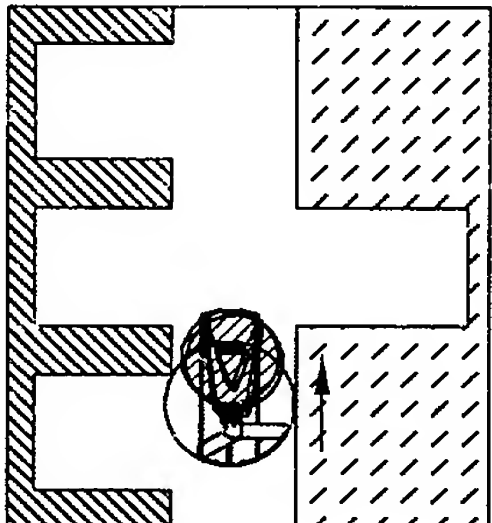
retract radial axis

FIG. 28-2



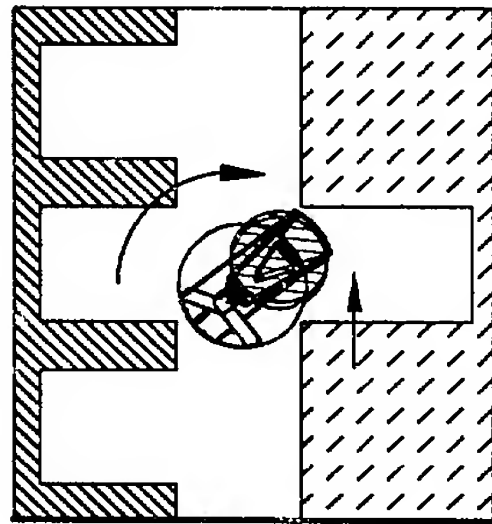
rotate theta axis
and move X axis
back to avoid
collision

FIG. 28-3



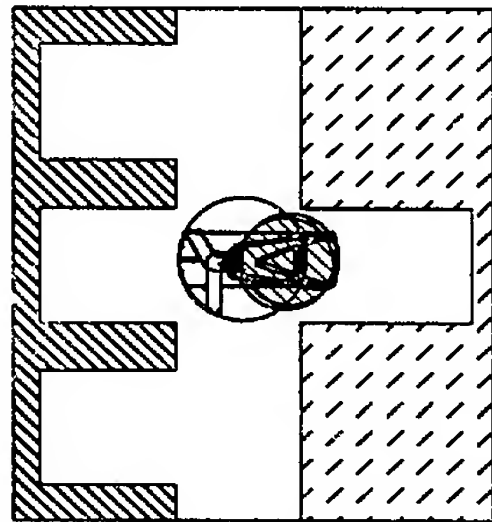
move X axis
forward toward
process station

FIG. 28-4



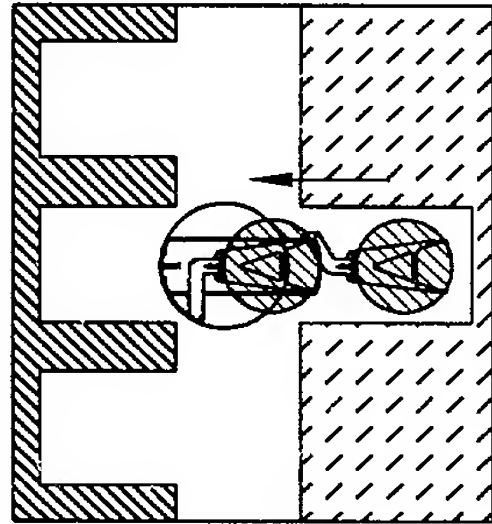
rotate theta axis
and move X axis

FIG. 28-5



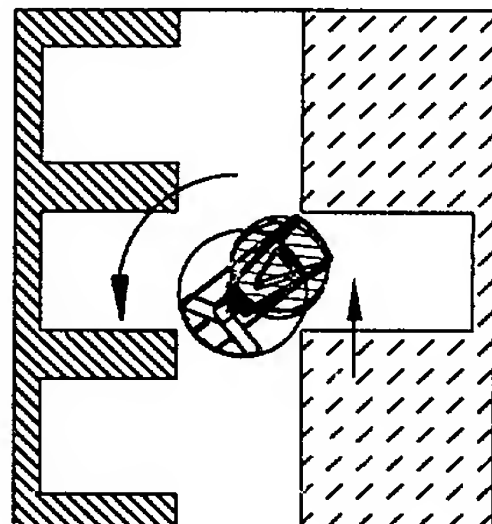
wall for process
to complete

FIG. 28-6



swap processed
wafer for new
wafer ready
for process

FIG. 28-7



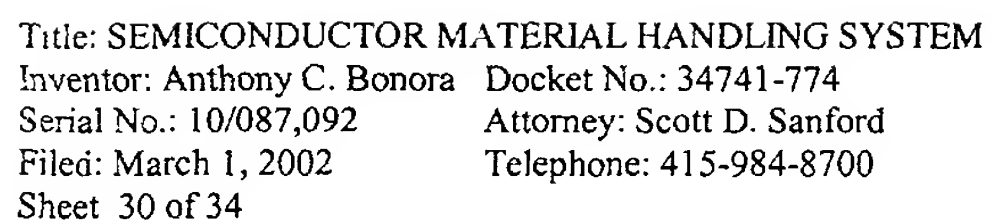
retract radial
axis. move X and Theta

FIG. 28-8

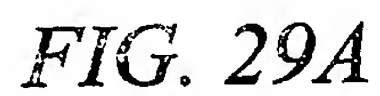


EFEM

Process Tool



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REPORT



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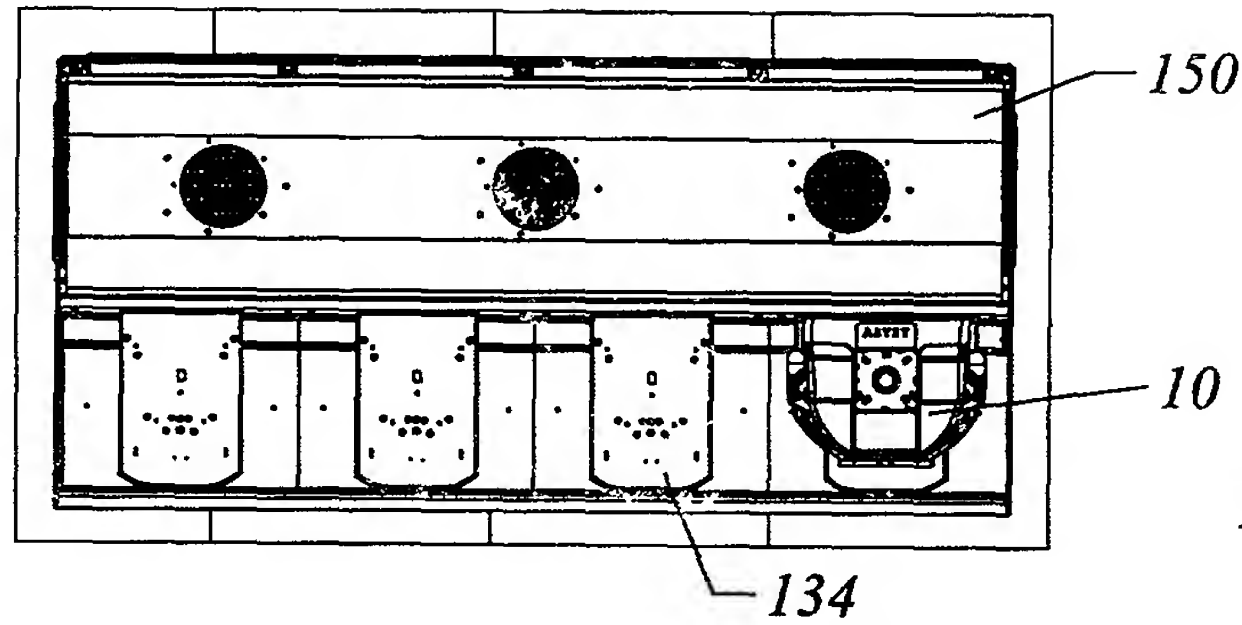


FIG. 29D

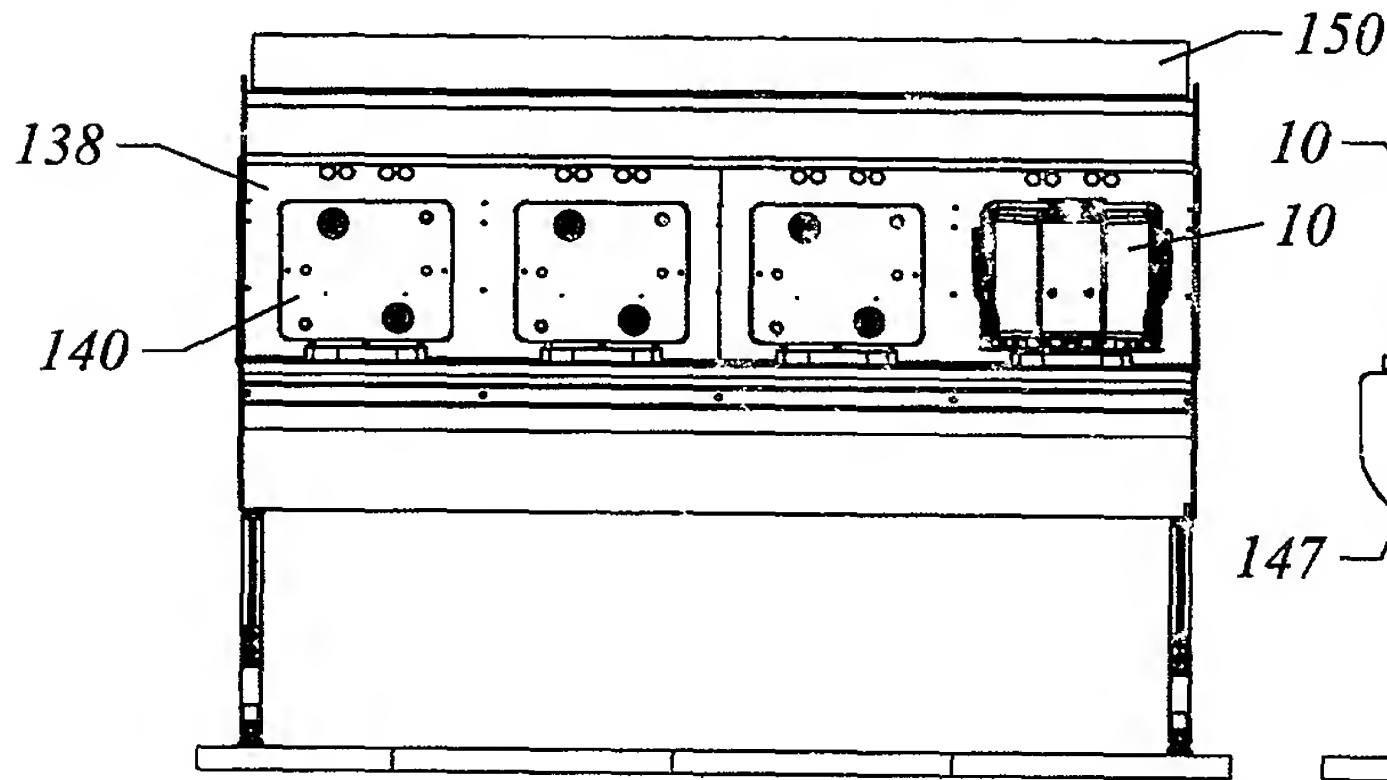


FIG. 29B

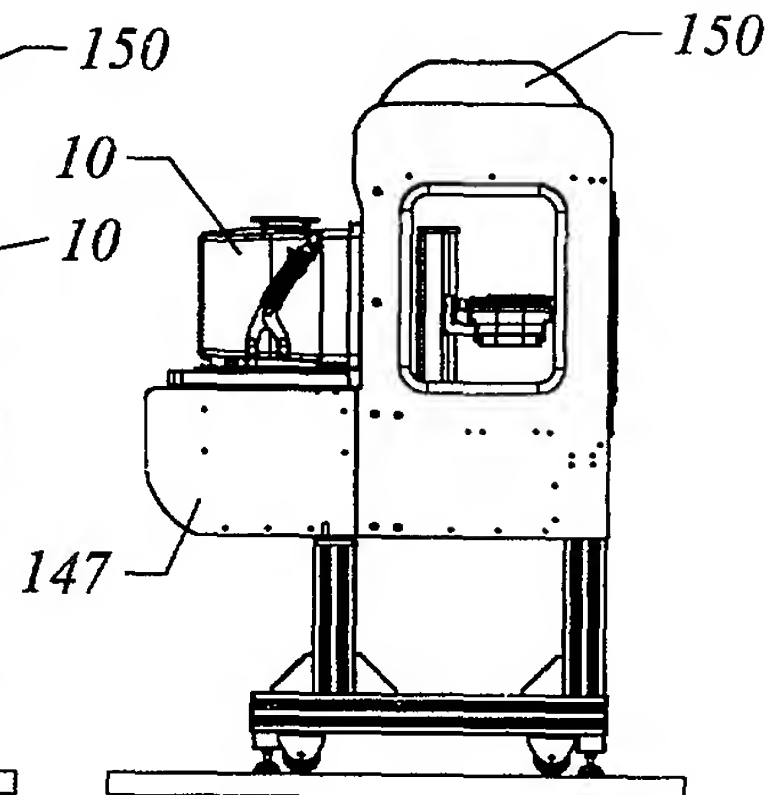


FIG. 29C

2002/03/20 2002/03/20



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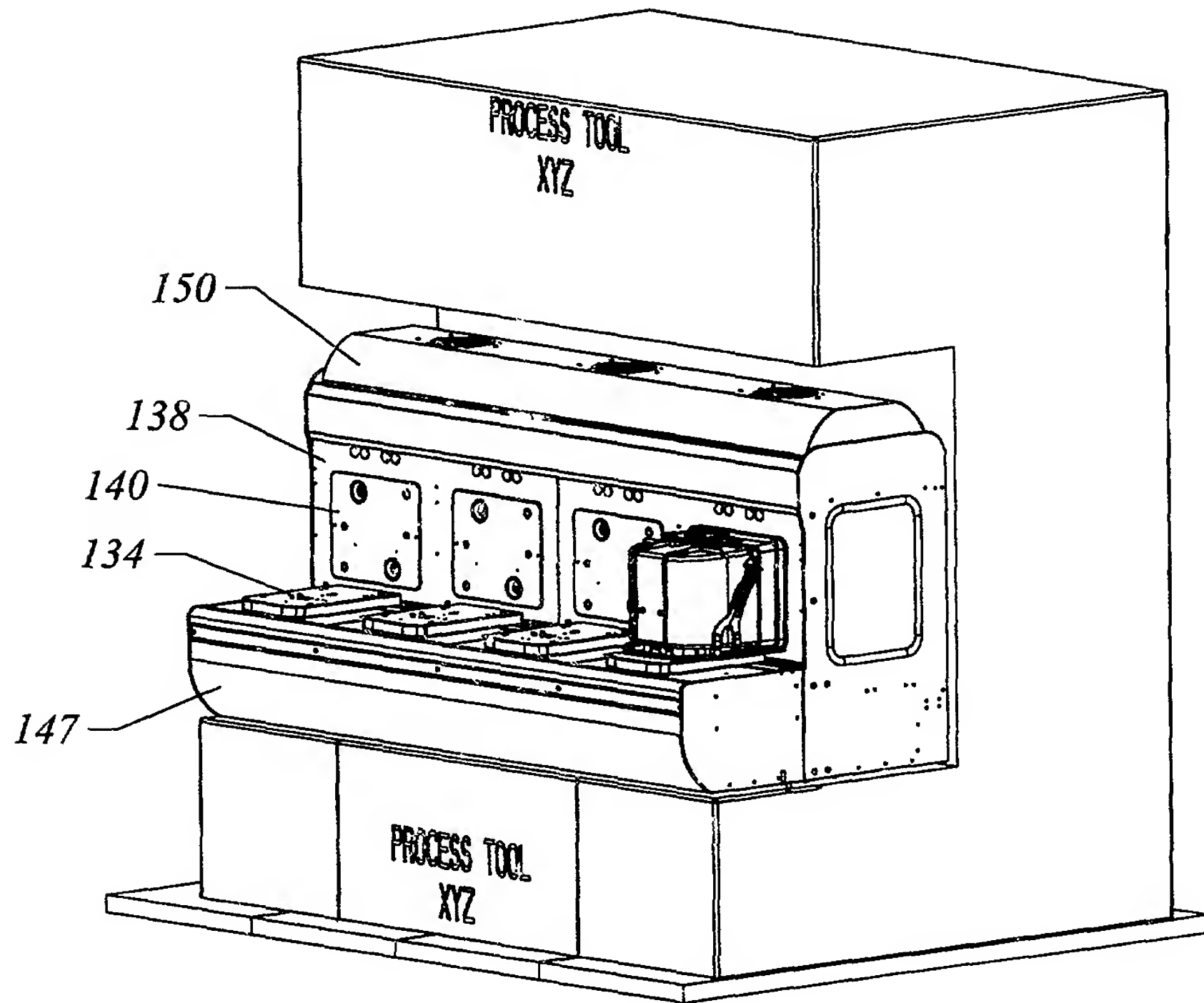


FIG. 30A



Title. SEMICONDUCTOR MATERIAL HANDLING SYSTEM
Inventor: Anthony C. Bonora Docket No.: 34741-774
Serial No.: 10/087,092 Attorney: Scott D. Sanford
Filed: March 1, 2002 Telephone: 415-984-8700
Sheet 33 of 34

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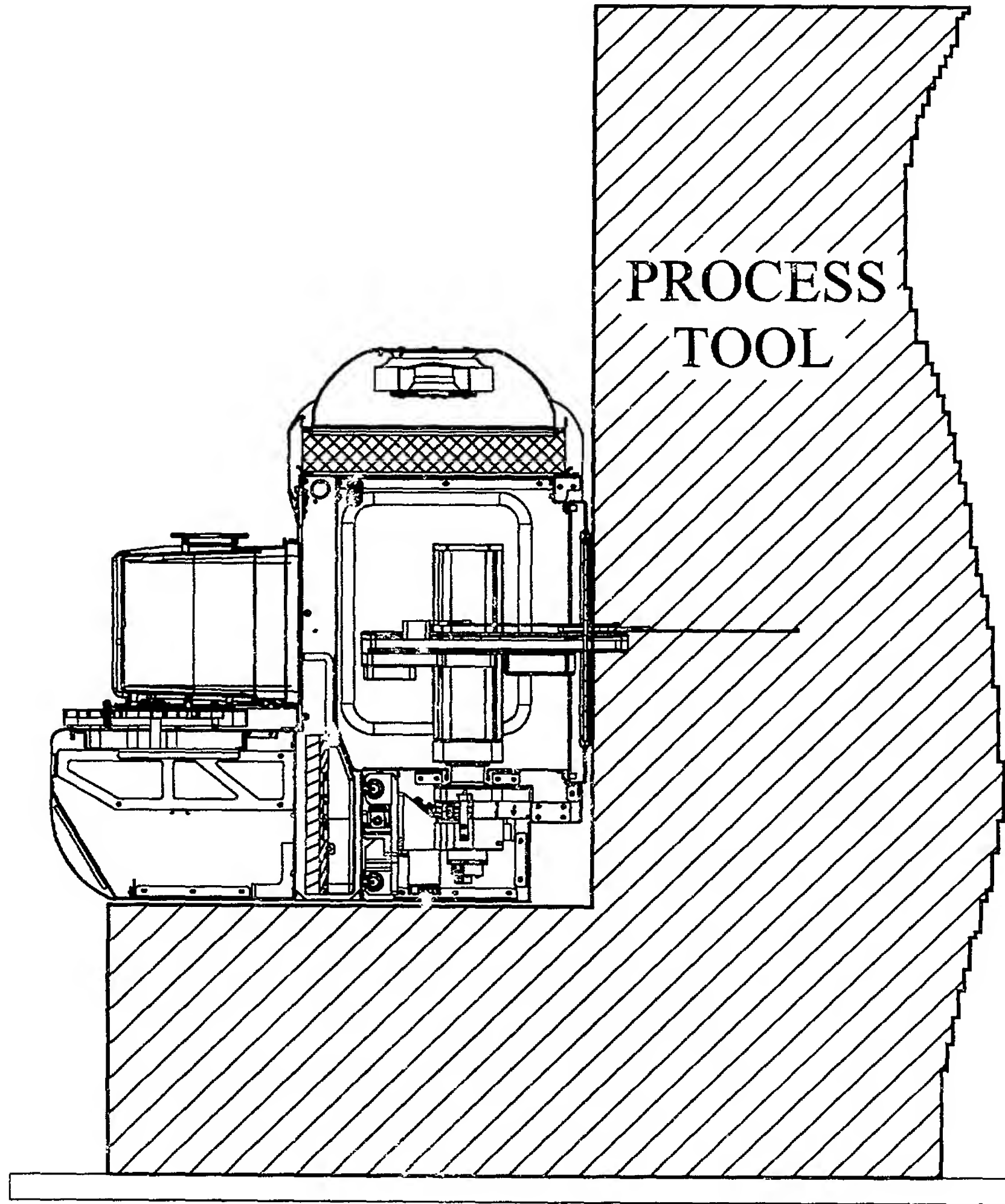


FIG. 30B



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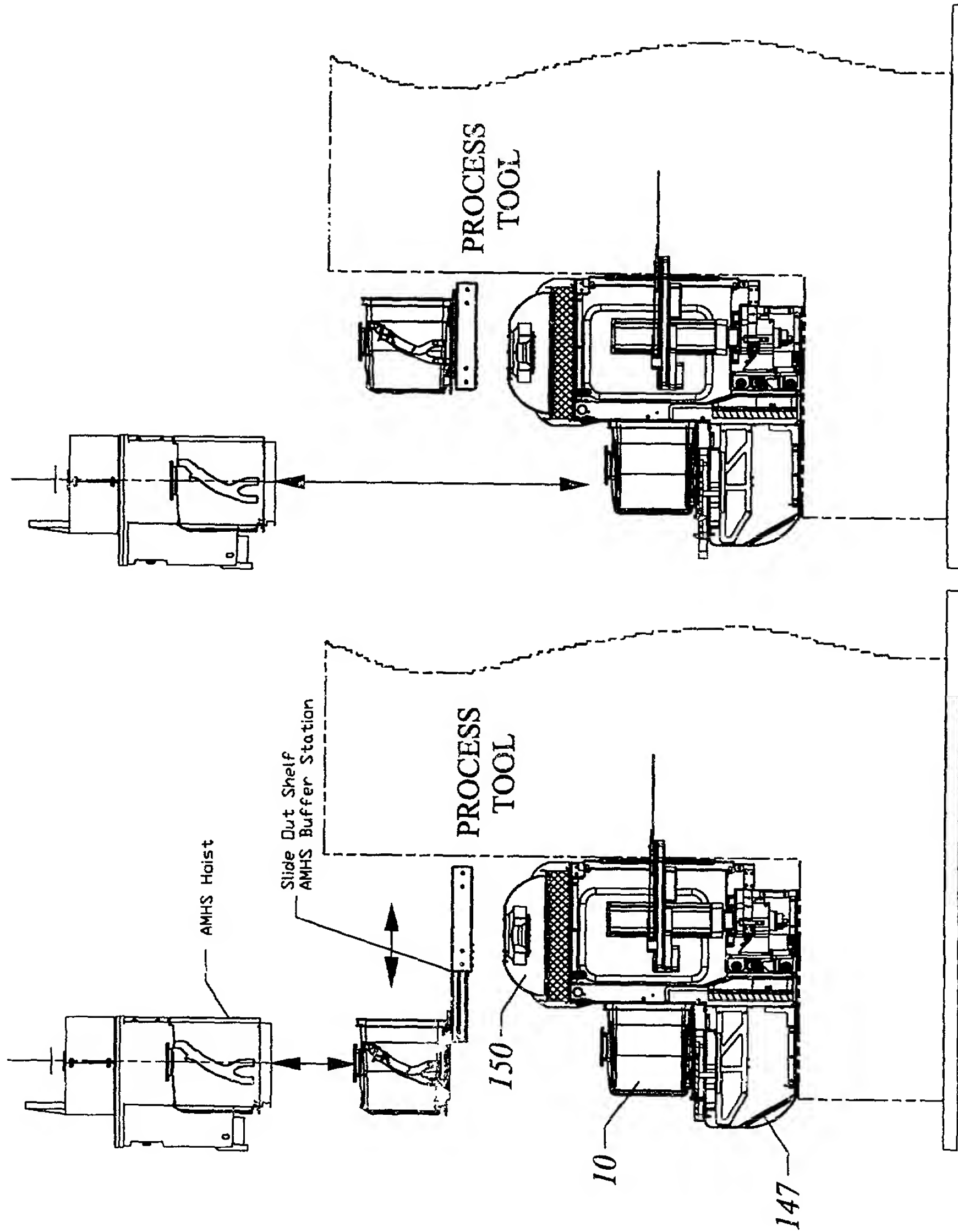


FIG. 31